

Language: English
Original: English



AFRICAN DEVELOPMENT BANK

**PROJECT: Transport Infrastructure Improvement Project (Phase I):
Railway Line Upgrading - Walvis Bay to
Kranzberg**

COUNTRY: Namibia

Project Number: P-NA-DZ0-001

**EXECUTIVE SUMMARY OF THE ENVIRONMENTAL AND SOCIAL
ASSESSMENT**

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July 2014**

Abbreviations and Acronyms

AfDB	African Development Bank
BoQ	Bill of Quantities
CBD	Convention on Biological Diversity
CSA	Consulting Services Africa
DEA	Department of Environmental Assessment
CFP	Chance Find Procedure
DEO	Designated Environmental Officer
EMP	Environmental Management Plan
ER	Engineer's Representative
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental and Social Management Plan
ESSI	Environmental and Social Screening Investigation
ESAP	Environmental and Social Assessment Procedures
EMA	Environmental Management Act
GHG	Green House Gases
GRN	Government of the Republic of Namibia
HPP	Harambee Prosperity Plan
HIV/AIDS	Human immunodeficiency virus infection and Acquired Immune Deficiency Syndrome
MET-DEA	Ministry of Environment and Tourism – Department of Environmental Assessment
IECO	Independent Environmental Control Officer
MoWT	Ministry of Works and Transport
NDP	National Development Plan
NSA	Namibia Statistics Agency
ISS	Integrated Safeguards System
PCR	Physical Cultural Resources
PPE	Personal Protective Equipment
STDs	Sexually Transmitted Diseases?
VAT	Value Added Tax
WW1	World War 1

1. OVERVIEW

The African Development Bank is considering financing the proposed *Namibia Infrastructure Development Projects* an investment support focused on the Harambee Prosperity Plan (HPP) priorities. The investment will encompass priority interventions in the Transport – Rail and Road; Agriculture and Education Sectors. This Environmental and social Assessment summary focuses only on the transport sector intervention proposed as the *Namibia Transport Infrastructure Improvement Project (Phase I)* that includes two main components (i) Upgrade of the Walvis Bay – Kranzberg Railway Line and; (ii) Upgrade of the Windhoek to Hosea Kutako International Airport Road Phase 2A. The two interventions in the rail sub-sector and road sub-sector, respectively, are complementary in the context of the strategic Vision 2030 aspiration of making Namibia a logistics hub to service the 400 million people SADC market. The overall objective of the intervention is to contribute to reduction of poverty and inequality, and boost economic growth through addressing bottlenecks in the transport infrastructure. The specific objective is to promote linkages of Walvis Bay sea port, in particular, to the hinterland and to the neighboring countries.

At the completion of the project, the expected outcome is the increased capacity of the railway line with the improved axle load capacity to meet the SADC standards, and resulting in the increased average train speeds to about 60-80 km/hr for freight in comparison to the present average speed of 20-40 km/hr. The increased capacity will promote competitiveness of the railway sub-sector with the ripple effect of (i) combined estimate of 4000 direct and indirect jobs to be created (ii) increased revenues for rail operator(s) and (iii) reduced cost of transport for the corridor with promotion of a more balanced modal split between road and rail, which is heavily skewed to road at present.

2. CONTEXTUAL FRAMEWORK FOR THE ESIA SUMMARY

Whereas the Transport Infrastructure Improvement Project (Phase I) will include two main components (A) Upgrade of the Walvis Bay – Kranzberg Railway Line and; (B) Upgrade of the Windhoek to Hosea Kutako International Airport Road Phase 2A; this report summarizes the Environmental and Social Impact Assessment (ESIA) pertaining to the Walvis Bay to Kranzberg Rail Upgrade Project Component. A separate ESIA was undertaken for the Windhoek to Hosea Kutako International Airport Road Phase 2A. The summary Environmental and Social Management Plan (ESMP) will also be disclosed in accordance with the Bank's requirements as stipulated in the ISS/ESAP.

The Walvis Bay – Kranzberg Railway Line upgrade is part of an integral part of a comprehensive national strategy to improve trade and logistical links through Namibia. The project consists of the comprehensive upgrade of a 210km rail link connecting the Port of Walvis Bay to the northern and southern limbs of the Namibian rail network. This anchors future rail network expansion along all key trade logistical corridors pursued in terms of national transport logistical planning. In consideration of the project's likely impacts on the physical, biological and socioeconomic environment, in 2016, the Ministry of Works and Transport (MoWT) of the Government of the Republic of Namibia (GRN) prepared an Environmental Scoping Report and the Environmental Management Plan (EMP) for the project. The two reports were prepared within the ambit of the Namibian regulatory framework and clearly identified the impacts and proposed measures that sought to avoid, minimize as far as possible before offsetting any residual losses through compensation.

According to the AfDB Environmental and Social Assessment Procedures (ESAP) embedded in the ISS, the project has been categorized as a Category one, which would thus require a full Environmental and Social Impact Assessment (ESIA). The summary of the ESIA is to be disclosed to the public for 120 days before presentation of the project to the Board for approval. In that respect therefore, both the Environmental Scoping Report and ESMP were later amalgamated and revised to align the in-country environmental and social assessment requirements for the Project with ADB's Integrated Safeguards System (ISS) so as to allow a meaningful assessment of the lender's risk and the management thereof.

3. SCOPE OF WORKS

The upgrading of the Railway Line between Walvis Bay and Kranzberg involves the comprehensive upgrade, rehabilitation and improvement of a 210 km section of the Namibian railway network that links the Port of Walvis Bay with some countries in the SADC region and national economy. The intervention is to be divided into three works packages for the implementation as Package A: Walvis Bay – Arandis; Package B: Arandis – Kranzberg; and Package C: Supply of rails and associated accessories.

The planned scope of works for repair and upgrade of the railway line include:

- i. Replacement of all rails and sleepers;
- ii. Re-conditioning of the ballast layer and replacement / addition of ballast as necessary;
- iii. Repair of the formation level, where necessary;
- iv. Replacement of manually operated switches with automatic normalising switches;
- v. Repair and maintenance of existing drainage culverts, and addition new culverts if required;
- vi. Replacement of three structural steel bridges, addition of new piers for one structural steel bridge, and strengthening or maintenance of the other five structural steel bridges;
- vii. Grade of railway conditions to allow: loading of 18.5 tons per axle, maximum passenger train speed of 100km/h, and maximum freight train speed of 80km/h.

Other activities associated with the project that were considered during the ESIA include;

- The complete Railway – track, working/operational corridor
- Locomotives and rolling stock (e.g. carriages, wagons).
- Power supply.
- Signalling equipment.
- Crossings (e.g. bridges, culverts) and tunnels.
- Drainage and erosion control structures.
- Safety and security measures (e.g. barriers and fencing).

Ancillary facilities

- Rail marshalling yards and depots, track maintenance and train servicing facilities.
- Fuel storage tanks, filling equipment.
- Temporary construction facilities (e.g. contractors' camps, workshops, laydown areas, working corridor outside the track, workers' accommodation, quarries and borrow pits).
- Security posts and infrastructure.
- Access roads within and between temporary facilities and the rail being developed, permanent maintenance roads.

No work will occur outside of the existing railway servitude; and only existing service and public roads will be used when transporting construction materials and vehicles to the railway servitude from appropriate material staging areas. Importantly, the works will be conducted in such a manner so as to not adversely affect the normal operational activities of the operator and the line must remain in commission during construction. This key

operational requirement necessitates specific construction methodology and approaches that will define the nature of construction activities.

4. POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK

The Government of the Republic of Namibia aims at sustainable development and therefore has put in place rigorous environmental and social safeguard measures enshrined in various laws, policies and strategies which were taken into consideration during the ESIA for the project.

The Constitution of the Republic of Namibia (1990)

Article 95 (1) of the Constitution provides that “the State shall actively promote and maintain the welfare of the people by adopting, inter alia, policies aimed at maintenance of ecosystems, essential ecological processes and biological diversity of Namibia and utilization of natural resources on a sustainable basis for the benefit of all Namibians both present and future; in particular the Government shall provide measures against dumping or recycling of foreign nuclear and toxic waste on Namibian Territory. "Article 101 of the Namibian Constitution further states that the principles embodied within the constitution" shall not have and by themselves be legally enforceable by any court, but shall nevertheless guide the Government in making and applying laws. The courts are entitled to have regard to the said principles in interpreting any laws based on them."

National Policies

In 1992, Namibia’s Green Plan was formally tabled at the United Nations Conference on Environment and Development (“Earth Summit”) in Rio de Janeiro, on behalf of the Republic of Namibia. It created a national common vision around its environmental issues, priorities and future actions, and drew together government, non-government organisations (NGOs), private sector and civil society towards a common future. The Green Plan led to Namibia’s 12-Point Plan for Integrated and Sustainable Environmental Management in 1993, which was incorporated into the first 5-year National Development Plan (NDP1) of 1994/5 – 1999/2000 and since then, has been adopted in all the subsequent NDPs since then including NDP5.

Vision 2030: Fifth National Development Plan (NDP5) of Namibia

NDP5 identifies the good condition for infrastructure as an enabler. The NDP5 subsumed the HPP aspirations and furthers the role of transport and logistics in promotion of trade, industrialization and socio-economic development and regional integration and is thus retained as a developmental priority. NDP5 commits to ensure sustainable environment and enhance resilience through conservation and sustainable use of natural resources and environmental management and climate change. The plan sets out the conservation and sustainable use of natural resources strategies and desired outcomes, 2017-2022 which include; (i) Strengthening sustainable land management (ii) Safeguarding ecosystems, species and genetic diversity (iii) Enhancing value addition and the sustainable utilization of biodiversity (iv) Sustaining environmental awareness campaigns

Environmental Assessment Policy, 1995

The Cabinet of the government of Namibia approved the Environmental Assessment (EA) Policy in August 1994, published as "Environmental Assessment Policy for Sustainable Development and Environmental Conservation, January 1995". It provides that all policies, projects and programmes should be subjected to EA procedures, regardless of where these originate. These procedures must aim for a high degree of public participation, and consider the environmental costs and benefits of projects proposed.

The National Environmental Health Policy

Throughout construction, implementation and decommissioning of any of its components, the Upgrading of the Railway Line between Walvis Bay and Kranzberg will be guided by the aim of

this Policy, which includes facilitation of the improvement of the living and working environments of all Namibians, through pro-active preventative means, health education and promotion and control of environmental health standards and risks that could result in ill-health; and Ensure provision of a pro-active and accessible integrated and co-ordinated environmental health services at national, regional, district and local levels.

Environmental Management Act 7 of 2007

The Environmental Management Act (2007) (EMA) was promulgated in December 2007 and is administered by the Directorate of Environmental Affairs (DEA), under the auspices of the Ministry of the Environment and Tourism. Its main objectives are to ensure that significant effects of activities on the environment are considered carefully and timeously. It also ensures that there are opportunities for timeous participation by interested and affected parties throughout the assessment process. This guided the proactive effort by the government in conducting the ESIA for the Upgrading of the Railway Line between Walvis Bay and Kranzberg

Labour Act of 1992

Regulations for the Health and Safety of Employees at Work. The Regulations relating to Health and Safety at the Workplace in terms of the Labour Act 6 of 1992 came into force on 31 July 1997. These regulations prescribe conditions at the workplace, and inter alia deal with the welfare and facilities at work-places, including lighting, floor space, ventilation, sanitary and washing facilities, usage and storage of volatile flammable substances, fire precautions, etc.; This was taken into consideration for the provisions made in the ESMP for Health and Safety of Employees at Work.

Nature Conservation Ordinance 4 of 1975 (as amended 1996)

The Nature Conservation Ordinance deals with in situ and ex situ conservation by providing for the declaration of protected habitats as national parks and reserves, and for the protection of scheduled species wherever they occur. It regulates hunting and harvesting, possession of, and trade in listed species. Although the project is following an existing alignment and the impact on conservation areas is negligible, the ordinance was reviewed and taken into consideration during the ESIA just to ensure that no provision was left to chance.

Atmospheric Pollution Prevention Ordinance 11 of 1976

The Ordinance provision on air pollution is administered by the Namibian Ministry of Health. Hazardous Substances Ordinance 14 of 1974, and amendments. This ordinance provides for the control of toxic substances. It covers manufacture, sale, use, disposal and dumping as well as import and export.

International Conventions and Protocols

Below are some of the key multilateral environmental agreements that are most relevant for the project and were taken into account during the Environmental and Social Assessment;

The Stockholm Declaration on the Human Environment, Stockholm 1972

The declaration refers to the fact that natural resources of the earth, including the air, water, land, flora and fauna and especially representative samples of natural ecosystems, must be safeguarded for the benefit of present and future generations through careful planning or management, as appropriate. The declaration also states that countries have a special responsibility to safeguard and wisely manage the heritage of wildlife and its habitat, which are now gravely imperilled by a combination of adverse factors. Nature conservation, including wildlife, must therefore receive importance in planning for economic development. The other component being that states shall take all possible steps to prevent pollution of the seas by substances that are liable to create hazards to human health, to harm living resources and marine life, to damage amenities or to interfere with other legitimate uses of the sea.

Convention on Biological Diversity, Rio de Janeiro, 1992

Namibia is accordingly now obliged under international law to ensure that its domestic legislation conforms to the CBD's objectives and obligations which requires ESIA's for projects that are likely to adversely affect biological diversity. It further requires that the EIA be aimed at avoiding or minimising such effects and where appropriate, allow for public participation in the assessment.

African Development Bank

The project shall be implemented in compliance with the Bank's Environmental and Social Assessment Procedures. The design, implementation and monitoring and evaluation modalities for the project have been informed by the Bank's environmental and social policies and guidelines. Considerations are premised on expectations for assessing and addressing environmental and social impacts in line with the Bank's Integrated Safeguards System (ISS) (2013): Based on the projects scoping report, all the five Operational Safeguards (OS) embedded in the ISS were considered and only four were triggered, and these are;

- *Operational Safeguard 1*: Environmental and social assessment, which is the overarching Operational Safeguard that mainstreams environmental and social considerations in all Bank operations
- *Operational Safeguard 3*: Biodiversity, renewable resources and ecosystem services which reflects the objectives of the Convention on Biological Diversity to conserve biological diversity and promote the sustainable management and use of natural resources.
- *Operational Safeguard 4*: Pollution prevention and control, hazardous materials and resource efficiency, which is intended to achieve to achieve high quality environmental performance, efficient and sustainable use of natural resources, over the life of a project
- *Operational Safeguard 5*: Labour conditions, health and safety that basically protects workers right.

Operational Safeguard 2 which provides for involuntary resettlement land acquisition, population displacement and compensation was considered but not triggered because the project does not have direct displacement of individuals and/or communities.

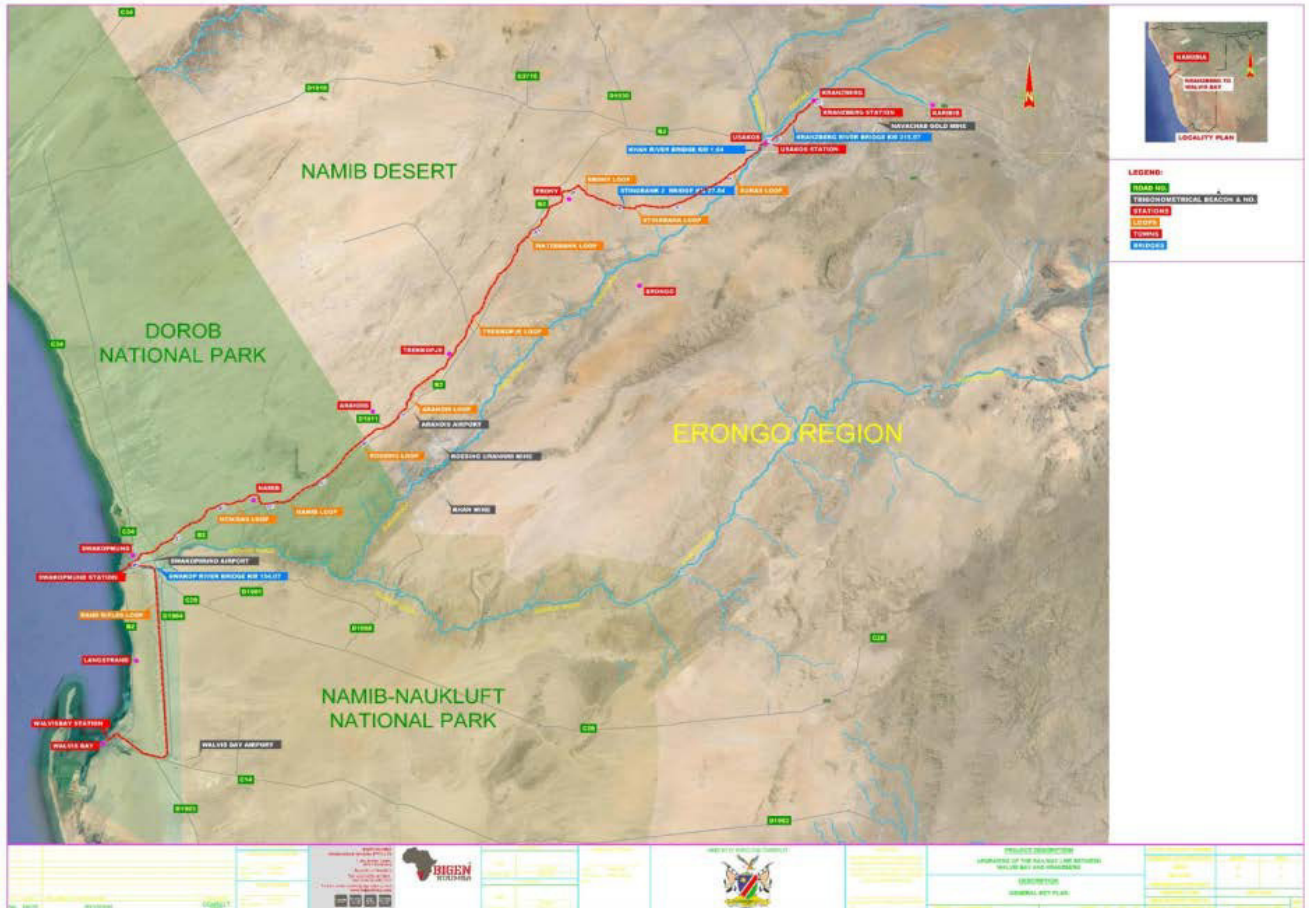
Other Bank policies that were closely examined include; Climate Action Plan, Policy on Poverty Reduction, the Policy on the Environment, the Gender Policy, the Policy on Disclosure and Access to Information and the Cooperation with Civil Society Organizations – Policy and Guidelines.

5. PROJECT AREA BASELINE INFORMATION

5.1 Description of the Project Area

The railway line traverses the Erongo region of Namibia. Erongo is one of the 14 regions of Namibia, its capital is Swakopmund. The Region comprises the Swakopmund magisterial district up to the Ugab River and includes the Walvis Bay, Omaruru and Karibib magisterial districts. It has an estimated population of about 150,400, according to the 2011 population census. This region is named after Mount Erongo, a well-known landmark in Namibia and in this area. Most of the main centres within this region are connected by railway line. The port of Walvis Bay in the Erongo Region is at the start and the end of the transport corridors, serving as a transport hub for regional and international trade between Southern African Development Community (SADC) countries and the rest of the world. The railway line traverses from the port of Walvis Bay through to Kranzberg where it branches to the north and eastern parts of the country as shown in figure 1 below..

Figure 1. Map of the project area showing the railway line.



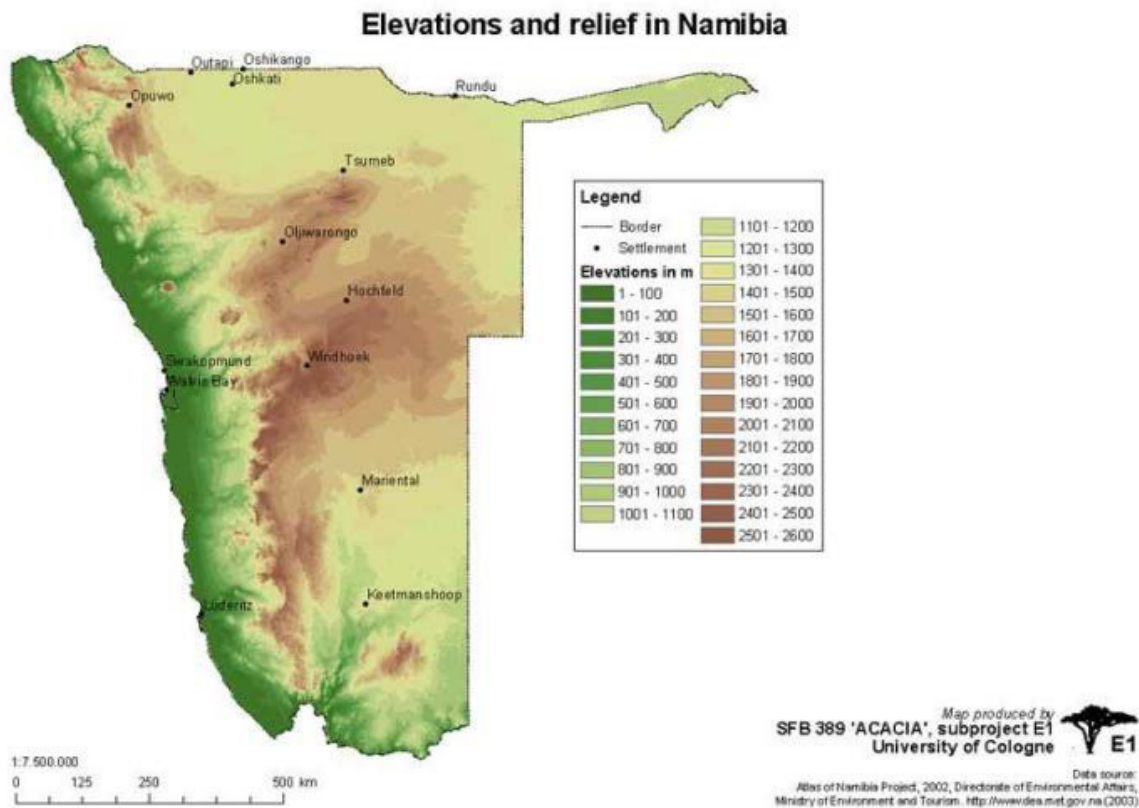
Map of project area showing the railway (red line) as extracted from the consultants report

5.2 Environmental Conditions

Topography

The Erongo Region stretches from the Central Plateau westwards across the Central-Western Plains and Escarpment to the Central Namibian coast, roughly over a distance between 200 and 350 km. Northwards the stretches from the Ugab River in the north to the Kuiseb River in the south over a distance of up to 300 km. On the west it is flanked by the Atlantic Ocean. The Central-Western Plains were largely formed by erosion cutting eastwards into the higher ground, thereby forming the catchment area of several major ephemeral rivers such as the Khan, Omaruru, Swakop and Ugab. From the topographical map (Fig.2) below, one can deduce that the railway elevation varies from 5m to 1079m above mean sea level. The lowest levels are along the coast, and the highest level is located near Ebony.

Figure 2. Map Showing Elevations and Relief in Namibia

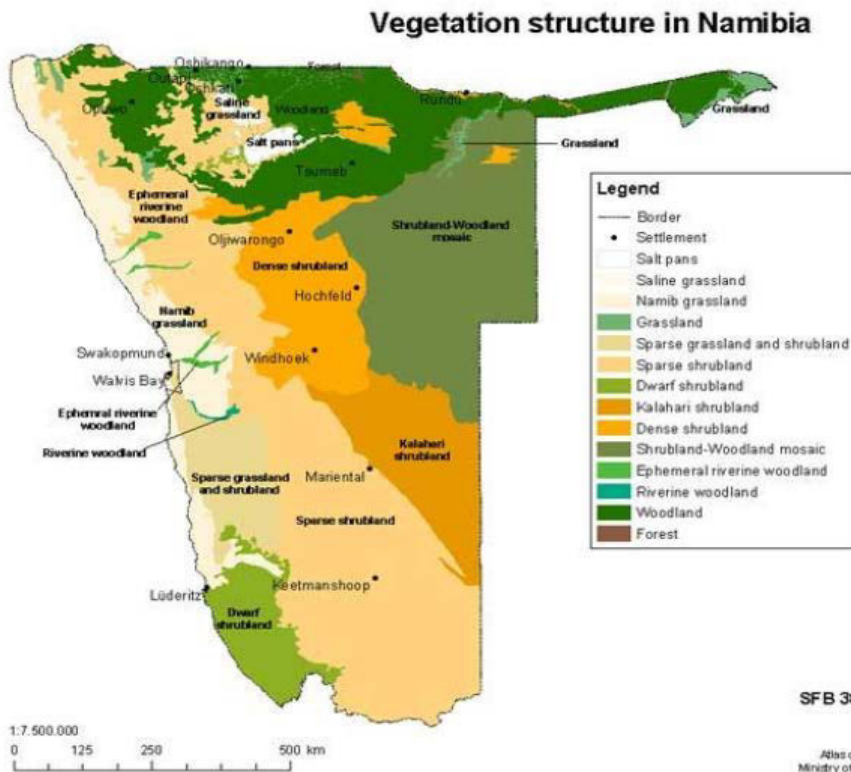


Map adopted from the Consultant's (Bigen Kumba) ESIA Report

Flora and Fauna

A large part of the railway section (about 140kms) is located in the Central Namib Desert. The Namib Desert is designated ecological area and forms part of the Dorob National Park. The Namib Desert is well known for its rare and endemic fauna and flora. It is important that these sensitive ecological landscapes located along the railway are protected from the damage that could result from construction activities. The well-known *Welwitschia* plant can be found east of Swakopmund. To avoid and minimise disturbance to these plants and all other flora and fauna along the length of the project, the Environmental Management Plan will restrict the movement of construction vehicles and machinery throughout the entire project length to only existing roads and the existing railway servitude, which is dedicated to the operation, maintenance and repair of the railway

Figure 3. Map showing the vegetation structure in Namibia



Map produced by
SFB 389 'ACACIA', subproject E1
University of Cologne

Data source:
Atlas of Namibia Project, 2002, Directorate of Environmental Affairs,
Ministry of Environment and Tourism. <http://www.dea.met.gov.na> (2003)

Map adopted from the Consultant's (Bigen Kumba) ESIA Report

Climate

Average annual rainfall decreases progressively from Kranzberg Station to the coast. Average annual rainfall in Usakos is 137mm (Ref 2), and less than 50mm in Swakopmund and Walvis Bay. Coastal fog occurs throughout the project limits. There are more than 125 days of fog per year in Swakopmund and Walvis Bay, and approximately 5-10 days of fog in Usakos. The coastal zone at Walvis Bay lies within a "cool desert" region of Namibia, a unique biophysical environment that is due to the specific climatic conditions in the area are influenced by the South Atlantic anticyclone, the northward-flowing Benguela Current and the divergence of the south-east trade winds along the coast. Climatic conditions in the region vary from cool, foggy, windy and hyper-arid conditions along the coast, to dry and hot weather towards the inland areas from which it is separated by the Great Escarpment.

Temperature

Namibia is considered to be hot; however, temperatures are highly variable daily and seasonally. The average temperature maximum varies between 24°C and 19.3°C, and the average minimum between 9.1 °C and 16.5 °C. Highest temperatures are recorded during Berg Wind episodes when cold air from the interior flows towards the coast and is heated by compression (catabatic wind).

Rainfall and evaporation

The area along the Walvis Bay has a mean annual rainfall of 13.5 mm. Most rain falls in summer between January and April, with the wettest month being March when about 50% of annual rainfall is recorded. Fog is a distinctive feature, and it gets some moisture from 900 hours of coastal sea fogs per year. Monthly average humidity varies between 65% in December and 81% in January/March. Namibia, as a country, loses more water through evaporation than it receives in rain. Lower rates of evaporation at the coast are mainly due to cooler and more humid coastal conditions.

Air Quality

Air quality is generally good for the entire project length. There are industrial areas located in Swakopmund and Walvis Bay, but these areas do not appear to be significant sources of air pollution. Trains travelling along the railway do emit pollution from the combustion of diesel fuel. These emissions will be reduced when the rolling stock is upgraded.

Noise

Noise is not significant along the project length. Noise is generated from activities occurring in the towns through which the railway passes, and from the traffic occurring on the B2 highway. Trains travelling along the railway will most certainly cause noise, but the noise only lasts for a short duration.

5.3 Socio-Economic Baseline Conditions

The unemployment rate in Erongo Region for population above 15 years of age is 30%. During the public participation meetings, an important issue raised was the hope that the Contractor would hire local individuals during construction. This has been incorporated into the Environmental and Social Management Plan and form part of the contractual content relating to construction activities. In the Stingbank communal farming area, the need for a new borehole providing acceptable quality potable water was raised at the public meeting. It was a hope of the community that the project could assist the community as a matter of social responsibility in providing a new borehole(s). It was also a hope of the community that the project could provide the community with VIP toilets, as there are no toilets of any kind in the area.

Settlement Patterns in Region

The project area of influence lies within the Erongo Region where about 80 % of the population in the region live in the urban areas. The rural areas are sparsely populated and actually there are very few homes observable along the whole rail transect explaining why there is no encroachment on the rail servitude and no individual/communities requiring resettlement for purposes of this project. 32% of Swakopmund residents live in decent housing, 41 percent live in shacks. Compared to other regions in the country, relatively little land has been acquired for resettlement purposes, mainly because the Erongo Region has an arid landscape which is not suitable for resettlement purposes.

Demography

The Erongo Region is one of the most affluent regions in Namibia, with the second highest per capita income in Namibia of N\$ 16 819 per annum. Only 0.4% of households in the Erongo Region spend more than 80% of their income on food while 5.3% of households spend 60 – 79% of their income on food. In comparison to this, 0.6% of households in the Khomas Region spend more than 80% of their income on food while 3% of households spend between 60 and 79% of their income on food, and in the Kunene Region, 11.2% of households spend more than 80% of income on food while 25.7% spend between 60% and 79% on food. Excluding the figures for Walvis Bay, the regional population grew from 55 470 to 79 722, at an annual rate of some 3.7%. If this is compared to the national growth rate of 2.6%, and a fertility rate that is lower than the national average, the high rate of population growth in the region should clearly be contributed to in-

migration to the main coastal towns. The mining development in the Region resulted in an increased in-migration to the coastal towns.

According to the 2011 Namibia Population and Housing Census indicators for Erongo region, sex ratio is 112 males for every 100 females, and the average number of children per woman declined from 3.2 in 2001 to 3.0 in 2011. Average household size is 3.3, and the mortality index declined from 42 per 1000 live births in 2001 to 38 in 2011. Males head 66% of all households in the Erongo region. The literacy rate for 15 years and older is 97%, 5% more than the 92% recorded in 2001 and higher than the national average of 89%. Walvis Bay town is the most populous with 26% of the total regional population. The main source of income in the region is; farming 3%, wages and salaries 73%, cash remittances 5%, business and non-farming activities 9% and pension 8%. About 20% of the population in the Erongo region were born in other regions; 65% of these are male, indicating the migration of mainly male workers from the other regions to the coast in search of employment.

Heritage sites

A meeting was conducted with the National Heritage Council on 12 April 2017 to learn if any of the bridges or sites are considered cultural heritage monuments. The Council stated that none of the bridges are considered cultural heritage monuments. The two closest national heritage sites to the railway were identified on the website of the National Heritage Council as monuments 076/1978 and 077/1978. Monument 076/1978 is a pair of regimental badges that were created during WWI with stones. There is a viewing platform at the site. The monument is located 27km east of Swakopmund, in between the railway and the B2 highway, 80m south of the railway Monument 077/1978 is a war cemetery that was established in 1915. The site is 46 km east of Swakopmund, approximately 500m northwest of the railway line

Employment

According to the Namibia Labour Force Survey 2014 Report (Namibia Statistics Agency - NSA) Published March 2015), in terms of economic sector, the major sectors of employment are agriculture forestry and fishing which accounts for about 30 percent of the employed population while the least is the Water supply and related industries as well as art, entertainment and recreation which accounts for 0.3 percent of the employed population. Males are far more likely than females to be employed in construction, transport and storage, while females are more likely than males to be employed in private households and wholesale and retail trade. In Erongo Region, employment levels for individuals aged 15 years and above stand at 70% as compared to the national figure of 63%

The economy of the Erongo region is mainly based on natural resources and is slowly becoming more diversified due to expansion in the mining industry. The largest industry in the region is the fishing industry, mostly based at Walvis Bay, followed by the mining and exploration industry. The Erongo Region which is known to offer some of the most spectacular and popular tourist destinations as well as a variety eco-, wildlife, cultural and adventure tourism opportunities has Tourism as the third biggest income generating activity.

Agriculture

According to the Erongo Regional website (<http://www.erc.com.na/>) the Erongo Region's whole eastern part and certain western parts are characterized by livestock farming on commercial farms in the districts of Karibib, Usakos and Omaruru, and in the communal areas at Okongwe, Otjohongoro, Otjongoro, Ozondati, Omatjette, Okombahe, Tubussis, Goabeb and Otjimbingwe. Cattle from commercial and communal farmers are marketed to Meatco, the national abattoir and procession facility, situated in Windhoek and Okahandja. Abattoirs at local towns are also supplied.

Commercial crop farming is practised in isolated areas such as on the banks of ephemeral Omaruru River at Omaruru. Some commercial farms serve as hunting or guest establishments, while some have been converted into game farms or reserves, aimed at regional and international tourists. The commercial farms provide employment to a substantial number of workers. Livestock farming depends heavily on the rainy season, with the average rainfall varying from below 100 mm in the far west to about 300 mm in the far east of the Erongo Region. The commercial farming in the Erongo Region falls outside the environmental footprint of the railway line.

Access to Services

According to the figures released by the National Statistics Agency (NSA) during the launch of the Census Regional Profile 2011 for Erongo, the region is among the three regions in the country with a high literacy rate with 97 percent of literacy among people aged 15 years and older. The figure is higher than the country's national literacy rate, which is estimated at 89 percent. The regional profile breakdown of the 2011 census on access to safe drinking water, toilet facilities and electricity shows that 96 percent of households in the Erongo Region have access to safe drinking water, while 81 percent use electricity for lighting. Furthermore, only 11 percent of households in Erongo are reported not to have access to toilet facilities and 15 percent use wood or charcoal for cooking.

6. PROJECT ALTERNATIVES

Introduction

Three broad project alternatives were considered. Alternative 1 entails a repair & upgrade of the existing railway line and replacement of the existing steel bridges. Alternative 2 entails most of the work of Alternative 1 plus re-alignments of the railway line intended to reduce travel times. Alternative 3 is the "No Go" alternative.

6.1 Alternative 1: Repair & upgrade of the existing railway line only

Description

- Replacement of all rails and sleepers;
- Re-conditioning of the ballast layer and replacement / addition of ballast as necessary;
- Repair of the formation level, where necessary;
- Replacement of manually operated switches with automatic normalising switches;
- Repair and maintenance of existing drainage culverts, and addition new culverts if required;
- Replacement of three structural steel bridges, addition of new piers for one structural steel ridge, and strengthening or maintenance of the other five structural steel bridges;
- Grade of railway conditions to allow: loading of 18.5 tons per axle, maximum passenger train speed of 100km/h, and maximum freight train speed of 80km/h

The plan is for the above work to be executed while allowing the railway line to continue operating during the construction period, except for short periods when four of the bridges are being reconstructed. It is envisaged that a contractor would completely replace a section of the rails and sleepers every day, working around the times that trains are travelling. The work will involve removing the existing rails and sleepers, and then lifting, cleaning and re-setting the ballast layer. Specialised machinery will be used. New ballast will be added where needed. The formation layer (under the ballast layer) will also be repaired and re-compacted where necessary

6.2 Alternative 2: Repair & Upgrade of the Existing Railway Line and One or More Changes to the Railway Alignment

Description

Alternative 2 includes the same scope of work as Alternative 1 and an additional 3 realignments to be considered for the purpose of reducing the travel time between Kranzberg Station and Walvis Bay. The following are the re-alignments that were considered and evaluated:

- Usakos bypass re-alignment - intended to reduce travel times by avoiding travel through the town. This re-alignment would require significant and costly construction work
- Namib re-alignment – intended to reduce travel times by shortening the travel distance and eliminating small curves. This re-alignment is very long, and would require significant and costly construction work.
- Swakopmund bypass re-alignment - intended to reduce travel times by avoiding travel through the town. This re-alignment would be constructed within the Dorob National Park, and would require significant and costly construction work. Several small re-alignments to be constructed throughout the project length for the purpose of smoothing out sharp curves.

Environmental and Social Investigation of the re-alignments under consideration

An Environmental and Social Screening Investigation (ESSI) was performed by CSA which included a preliminary identification of the potential impacts of the three major alignments.

- For any one of the 3 major re-alignments, the amount of construction materials and the area of land to be disturbed, both for the new railway sections and for materials extraction, would cause significant environmental impacts.
- The Usakos bypass alignment conflicts with Usakos' future plans for the town's development. It also conflicts with an existing private property located west of Khan River, which would require significant compensation.
- The Namib re-alignment would impact commercial farms and require significant compensation.
- The Swakopmund bypass alignment could impinge on the Swakopmund Airport's and NamWater's plans for future development. It also would represent new land development within the ecologically sensitive Dorob National Park.

The ESIA concluded that some of the above issues dramatically increase the complexity of the project, pose risks to sensitive and protected environmental areas, and would disrupt and require costly compensation for some local communities and land owners.

Project Engineer's evaluation of the viability of the re-alignments under consideration

The Project Engineer (Bigen Kuumba) investigated the different re-alignments to calculate the reduction in travel time that would result from each, as well as the estimated cost of each. The investigation concluded that, even if all of the re-alignments listed above were implemented together, the total reduction in travel time would only amount to 20 minutes, which is insignificant. The costs to construct any one of the major re-alignments, on the other hand, would be exceptionally high. All of the re-alignments were therefore concluded to be unviable; and the Project Engineer's recommendation to the Proponent was that none of the re-alignments should be implemented. The Project Engineer's recommendation has been accepted by the Proponent.

Conclusion on project alignment

Alternative 2 will achieve the Proponent's objectives of repairing and upgrading the railway to address existing safety issues and meet SADC railway standards. However, only a slightly better reduction in travel time than that of Alternative 1 would be achieved (20 minutes) if all of the major

re-alignment options of Alternative 2 would be implemented. The travel time reduction achieved from any one major re-alignment option would be insignificant though.

Unlike Alternative 1, Alternative 2 would result in significant environmental and social impacts for any one of the major re-alignments. Furthermore, the cost of any one of the major re-alignments would be very expensive without any significant reduction in travel time resulting. Pursuing any of the major re-alignments of Alternative 2 would also require a full ESIA with specialist studies to be performed for both biodiversity and heritage.

6.3 Alternative 3: ‘No-go’ Alternative

Description

Alternative 3 would entail making no changes to the existing railway infrastructure located between Kranzberg Station and Walvis Bay. This alternative would entail a continuation of serious safety risks due to the derailment conditions previously discussed and the potential for structural failure at some of the bridges. It would also continue to pose serious environmental risks due to the potential for spillage of hazardous substances during a derailment.

Conclusion

Alternative 3 is clearly not recommended given the serious human safety and environmental risks of existing railway conditions. Alternative 3 is also not supported by the Proponent.

Therefore **Alternative 1** was the recommended alternative for the reasons stated above. No specialist studies would be needed for the environmental assessment of Alternative 1 since all work is to occur within the existing servitude boundaries, and only existing roads and the existing servitude will be utilized for the transport construction vehicles, machinery and materials. The Environmental Scoping Study Report, together with an Environmental Management Plan which have been revised to form the Full ESIA acceptable to the lender, have therefore been submitted to Ministry of Environment and Tourism – Department of Environmental Assessment (MET-DEA) to obtain an Environmental Clearance and to the African Development Bank for clearance and disclosure based on the assumption that Alternative 1 will be implemented.

7. POTENTIAL IMPACTS AND MITIGATION/ENHANCEMENT MEASURES DURING CONSTRUCTION PHASE

7.1 Evaluation and analysis of impacts

Evaluation and analysis of impacts was carried out according to national and internationally accepted procedures, where each identified impact was analysed individually according to a number of criteria including descriptions of their magnitude, extent; duration; and probability of occurrence; the value of the affected environment; likely degree of recovery of the affected area, the level of public concern of the affected area and political repercussions arising from the impact. The evaluation aimed at identifying the most significant impacts, which would require interventions in terms of mitigation and enhancement measures. While it is acknowledged that all development activities cause negative and positive impacts on social, environment and economic parameters, on this project, not all impacts deserved considerations for mitigation or enhancement measures.

7.1.1 Positive Socio-Economic Impacts

High economic spin-offs are expected as a result of employment on the project during the construction phase and during operation phase. The expected surge in employment opportunities will be direct and indirect in nature through direct labour hire, provision of goods and services in other domains that are part of the railway's economic contribution.

Economic Development and Employment

There will be an estimated 4000 employment opportunities created directly or indirectly including jobs for skilled technicians on railway construction sites, jobs for casual workers, livelihoods earned by the railway side communities and technical and non-technical jobs during the railway operation phase. Establishment of construction campsites will create direct and indirect employment to the local as well as people from other places. Direct employment will be in the form of unskilled labourers and skilled labourers. Indirect employment will include employment of food vendors (especially women) and other small businesses like soft drinks. Creation of employment opportunities has both economic and social benefit. In the economic benefit, abundant unskilled labour will be used in economic production while socially the young and energetic otherwise poor people will be engaged in productive employment other than remaining idle. Employees with diverse skills are expected to work on the site during the construction period. Unskilled employees will gain some skills. As it continues to be one of the benefits of railway side communities, vending in a variety of items will continue at railway station after completion of the project.

Gains in the Local and National Economy

There will be gains in the local and national economy as a result of the construction of the proposed project, through consumption of locally available materials including: timber, metals and cement. The consumption of these materials in addition to fuel, oils for the machines to be used at the site and others will attract taxes including Value Added Tax (VAT) and Income Tax which will be payable to the government.

7.1.2 Negative Socio-Economic Impacts

Disruption of Existing Railway Services

The proposed project might create some disruptions to the existing railway services. To mitigate this impact, the proposed upgrading and rehabilitation works will be implemented in such a manner to allow for a scheduled service provisions.

Increased Risk of HIV/AIDS

Like many other sub-Saharan countries, Namibia also faces the HIV/AIDS challenge and its impacts on development. According to the Namibia Aids Response Progress Report 2015 Reporting Period: 2013 – 2014, published by the Namibia Ministry of Health and Social Services. HIV prevalence amongst people aged 15 – 49 is estimated to be 16% and the total population of PLHIV aged 15 and above is estimated at 260,000. The revised 2015 estimated projects People living with HIV to increase to over 273,000 in 2017, and over 296,000 by 2020 (Ministry of Health and Social Services, 2015b). Under the circumstances, interaction between workforce and local communities may increase occurrence of communicable diseases, including HIV/AIDS and other sexually transmitted diseases (STDs). In addition improved communications between centres of population and between rural and urban areas may increase transmission and incidence of communicable diseases. Therefore incorporating HIV mitigation measure on the project is of paramount importance. The project will implement a health management system for the construction workforce, to ensure it is fit for work. This will also include conducting training and awareness raising for workforce and their dependents on HIV/AIDS and other communicable diseases; also a health awareness raising campaigns will be conducted for communities on similar topics. A schedule of activities and budget to address HIV Risk will be included in the contractors BoQ and EMP and will be approved and monitored by the Supervising Engineer. Subsequently all the progress made on these activities will form the Engineers monthly reports.

Labour and Working Conditions

Railway upgrade/construction is strenuous physical work. Poor management of occupational health and safety could lead to accidents, injuries and illnesses among workers; mental health issues due

to remote or enclosed living. Also differences in nationality, ethnicity, religion, etc. may lead to discrimination and harassment, and differences (perceived or real) in working conditions between workers may lead to resentment. For this project, the proposed mitigation measures include; Employment practices and working conditions will conform to International Labour Organisation (ILO) Standards, AfDB ISS/OS5 and Namibia regulations. Also a clear and comprehensive health and safety reporting and grievance procedure system will be established, and be freely available to all of the workforce

Existing National Heritage Sites

The two closest national heritage sites to the railway are identified by the National Heritage Council as monuments 076/1978 and 077/1978. Monument 076/1978 are regimental badges that were created with stones in 1915. There is a viewing platform at the site. The monument is located 27km east of Swakopmund, in between the railway and the B2 highway, 80m south of the railway therefore not directly in the railway right of way. Also there is Monument 077/1978 is a war cemetery that was established in 1915. The site is 46 km east of Swakopmund, approximately 500m northwest of the railway line. This monument is also out of the right of way and will not be impacted on by the project. The Contractor's vehicles, materials and employees will not be allowed to venture or operate within 50m of the heritage monuments. In case of chance finds of physical cultural resources along the construction corridor from Walvis Bay to Kranzberg during earthworks, a methodological removal will be conducted with the help of relevant GRN departments.

Impact on existing NamWater Pipeline Crossings

There are two NamWater pipelines that cross the existing railway line. These pipelines include:

- 1) The pipeline from the Areva desalination plant to the Swakopmund Reservoir crosses under the railway line at one point located just east of Swakopmund.
- 2) The Kuiseb – Swakopmund pipeline runs from the Swakopmund Reservoir to a reservoir located south of the Dune 7 (east of Walvis Bay) and then continues southward. This pipeline crosses under the railway line in two locations: i) just south of the Swakopmund River, and ii) where the railway makes a ninety degree turn towards Walvis Bay, near Dune 7.

Details about the crossings and conditions for working in the vicinity of the crossings are to be obtained from NamWater when the application for Way Leave is submitted by the Engineer and approved by NamWater. The Contractor and ER will work closely with NamWater prior to and during construction activities to avoid and/or minimise any disruptions of water supply during the construction phase.

No-Go Areas

Any area located outside of the railway servitude, Contractor's Camp, or existing access roads will be considered as a No-Go area for vehicles, materials and employees. If for whatever reason the Contractor believes it is necessary to venture into a No-Go area, then the Engineers Representative (ER) and Independent Environmental Control Officer (IECO) must first be notified. The IECO must then notify MET and national park managers to review the situation and obtain approval or denial. If deemed necessary, a biodiversity specialist will need to be hired to study the specific site to be disturbed and the potential environmental impacts of such disturbance. If by accident a No-Go area is ventured into by the Contractor, then the Contractor must immediately inform the ER and IECO about such incursion and disturbance. The IECO must then notify MET and national park managers, and the No-Go area must be inspected for potential impacts and damage, and the way forward determined.

Employee Facilities

The Contractor will provide a designated dining area with cooking facilities, tables, chairs, trash bins and washing facilities inside the Contractor's Camp. Shaded eating facilities shall also be provided within the servitude for dining and break times. Cooking facilities shall be located a safe distance from fuel storage areas. Fires shall only be permitted in designated, safe areas within the Contractor's camp. The Camp shall include toilets at a minimum ratio of 1 toilet per 15 workers, for both male and female employees. The toilets must be maintained in a clean, hygienic condition, and stocked with toilet paper. The toilets should not be located in depressed areas. The toilets must be secured to the ground. The waste cannot under any circumstances be discharged into the environment. Hand washing facilities must be provided near to the toilets. Toilets and hand washing facilities must also be provided in the railway servitude near construction activities, as per above requirements. Enclosed sleeping areas with beds and adequate bedding, as well as adequate privacy, must be provided at the Camp for all employees. Security guards shall be provided by the Contractor to look after the employees' personal property and facilities, as well as the other areas of the Contractor's Camp

7.2 Environmental Impacts

7.2.1 Positive Impacts

Reduction in GHG emissions

Data published by reputable agencies like Environmental Protection Agency (EPA) of the US, though not gathered in Africa, indicate that expanded use of freight rail offers a meaningful way to reduce greenhouse gas emissions without harming the economy. On average, railroads are four times more fuel efficient than trucks. That means moving freight by rail instead of truck reduces greenhouse gas emissions by 75 percent. The upgrade of the Walvis Bay to Kranzberg railway line will contribute to the improvement of the efficiency of the rail system in Namibia and in turn, it is envisaged that an increasing number companies and individuals will switch from use of road transport to rail for general movement of goods and services which will contribute substantially to reducing GHG emissions. The reduction will further be made possible with the planned acquisition of new, more efficient locomotives coupled with skills improvement of engineers and other technical persons.

7.2.1 Negative Environmental Impacts

Environmental Hazard Management

Considerations for ensuring effective environmental hazard management will be explored and integrated into the comprehensive Construction phase Environmental Management Plan (CEMP) which will be elaborated upon by the contractor using the Approved ESMP as a benchmark. Environmental hazards that must be factored include the handling of hazardous materials. TransNamib will also be required to develop an Emergency Response Plan.

Impact of Construction Noise

During construction phase, noise and vibration levels at the site and surrounding areas will increase as result of construction activities which will involve use of machines and equipment's. These may include compaction machines, heavy duty vehicles bringing material to site, concrete mixer, grilling machines, welding machine, iron and timber cutting machines, etc. For example, substantial noise will result when welding, grilling, cutting timber or iron and vehicles unloading building materials like sand, gravel, etc. In case of excessive noise, this impact will affect project workers and railway side communities. However, this impact will be short term and will end after construction activities. Traffic/operation scheduling will be employed to eliminate the issues of related noise – both during upgrade of the railway and its operational phase.

Dust Control

The Contractor will minimise the generation of dust from transport and construction activities. If needed, construction and transport activities will be temporarily stopped during high wind conditions. The Contractor will be required to do dust suppression by means of watercarts on access roads and other affected areas.

Solid Waste Management

Domestic solid waste of workers both on site and camps will be generated. Scavenger-proof waste bins shall be provided throughout the camp, at the following locations (but not limited to these locations): ablution area, dining area, sleeping area, office area, workshop area, storage and laydown areas, and at Camp entrances / exits. A waste storage container shall be provided at the Camp into which the bins are dumped regularly. The waste storage container shall be emptied on a weekly basis or as needed. Under no circumstances can solid waste be burned, dumped or buried at the Camp or railway servitude. All solid waste is to be transported to a permitted landfill facility.

Construction-Related Waste

These will come from waste gravel and stone in construction phase, concrete mortar and waste asphalt concrete at construction site; demolition and disposal of old rails and sleepers. The existing rails that are replaced by new rails will be cut on-site to reduce their length placed in containers, and transported off-site for recycling purposes elsewhere. All other construction-related waste will be transported and disposed of off-site in a permitted landfill facility

Risk of Accidents and Injuries to Workers

This is a risk likely to result from intensive engineering and construction activities including fastening and installation of railway track panels, metal grinding and cutting, concrete work, steel erection and welding among others, construction workers could be exposed to risks of accidental falls from high elevations, injuries from hand tools and construction equipment, cuts from sharp edges of metal sheets and may cause fatality. Thus, a priority will be given to safety of the workers directly working at construction sites. There will be strict adherence to the established Safety, Health requirements and appropriate PPE will be provided for in the Contractors BoQ. Due attention will be paid to this issue by the Government monitoring teams, the Supervising Engineer and contractor to ensure full compliance in usage.

Rehabilitation of Railway Servitude and Contractor's Camp Site

As previously explained, the upgrading of the railway line will take place within the existing railway servitude, and the transport of materials and machinery to the site will only occur on existing roadways and within the railway servitude. The area disturbed within the railway servitude will be rehabilitated once construction activities have been completed. The Engineer and IECO will take photographs of the railway servitude and of the contractor's camp site before either area has been disturbed. The IECO and ER will specify precisely how the land is to be rehabilitated at the end of the construction so that it is returned to a similar condition as prior to the railway upgrade. However, the rehabilitation work will include raking and levelling the disturbed ground to a smooth surface condition.

Fuel Storage and Re-fuelling at the Contractor's Camp

Fuel will typically be delivered to the Contractor's Camp in a suitably sized fuel storage/transport tank. The Contractor must ensure that fuel tanks are in good condition without leaks. Fuel tanks must be located on an impermeable, concrete slab that is banded. The storage volume of the banded area must be 30% greater than the volume of the storage tank (or combined volume of storage tanks). The tank(s) shall be inspected daily for leaks. A leaking tank must be repaired immediately, or replaced immediately. The fuel storage and re-fuelling area shall be a designated area where only authorised employees are allowed. The Contractor must provide adequate fire suppression equipment at the fuel storage and re-fuelling area.

Material Storage at the Contractor's Camp and within the Railway Servitude

All construction materials will be stored within the Contractor's Camp when practical or within dedicated laydown areas for perway construction and within the existing railway servitude. All storage areas are to be maintained in a neat and tidy state. Stockpiles of ballast and other materials shall have a minimum stockpile base width while maintaining natural, stable stockpile side slopes. The material stockpiles shall not pose a safety risk in any way for persons or vehicles moving in their vicinity. Hazardous substances shall be stored in secondary containers. As previously stated, material safety data sheets shall be available on site at all times. A weatherproof, impervious container / skip shall be provided at the Camp for the temporary storage of hazardous waste. The container / skip shall only be disposed of at a landfill that is licensed to receive hazardous waste. The Contractor shall provide the ER with a copy of the Certificate of Disposal after each disposal of the container / skip

Equipment Storage and Maintenance

Drip trays shall be provided for all vehicles and plant and checked daily. Any vehicles and plant that have leaking lubricants, fuels or other hazardous fluids shall be repaired or removed from the site. A properly bunded wash bay shall be installed and approved by the IECO and monitored by the IECO and ER. The washing of vehicles and plant shall be kept to a minimum. Only **environmentally** friendly, low phosphate, low nitrate, low foaming detergents will be allowed and must be approved by the IECO prior to use

7.4 Environmental Training and Awareness

Induction Course

The Contractor, under the leadership of the Contractor's DEO and Health & Safety Officer, shall conduct an induction course for all of the Contractor's and Sub-Contractors' staff prior to those staff commencing their work activities on site. The induction course shall cover important environmental and health & safety issues and responsibilities, including but not limited to the following:

- Awareness about the environmental sensitivity of the Dorob National Park and Namib Desert;
- Clear instructions about No-Go areas. No work is to be performed outside of the existing railway servitude, and no vehicles or persons are to travel outside of existing roads, access roads, railway servitude or the Contractor's camp;
- Awareness about national heritage sites in the vicinity of the project site;
- No trapping, poisoning or shooting of animals is allowed;
- No removal or disturbance of vegetation or the land area outside of the existing railway servitude and minimisation of disturbance of vegetation within the servitude wherever possible;
- Information regarding all wayleave conditions
- Instructions on proper handling of hazardous materials;
- Instructions on proper storage of materials and machinery;
- Health & safety instruction, including the importance of wearing personal protective equipment (PPE)
- Instructions about only using designated toilet, washing and eating facilities and areas;
- Information about HIV/AIDS, sexually transmitted diseases (STDs), tuberculosis and preventative measures;
- Information about the availability of free condoms to all staff at the Contractor's Camp;

7.5 Penalties

The Contractor, under the leadership of the DEO, shall ensure that all employees of the Contractor, sub-contractors, and suppliers are familiar with, understand, and adhere to this EMP. Failure by any employee of the Contractor, sub-contractors, or suppliers to comply with the EMP shall be considered sufficient cause for the ER to instruct the Contractor to have the relevant employee removed from the site. MoWT may also order the Contractor to suspend part or all of the works if there is non-compliance with the EMP. Such suspension shall be lifted only when the offending procedure or requirement is corrected and/or if required remedial measures are put in place. Penalties for the incidents described below will be imposed by the ER on the Contractor and/or his/her sub-contractors and suppliers after consultation with the IECO.

8 POTENTIAL IMPACTS AND MITIGATION/ENHANCEMENT MEASURES DURING OPERATION PHASE

The potential impacts during the operation phase are summarised and briefly discussed below together with mitigation measures where applicable.

8.1 Potential Positive Impacts

Improved and Reliable Railway services: It is expected that the proposed project will result into improved and reliable services for passengers and freight delivery. The current average wagon turnaround time is roughly 10 days. Annual freight volumes for 2016 have not increased despite more than doubling of the number of available locomotives. The estimate is that the efficiency of rail operations will be improved by 10-15% and a reduction of wagon turnaround times from 10 days to 7 days. If this is achieved, customer confidence will slowly be restored to increase TransNamib's market share in the transport sector.

Employment Opportunities: The project will certainly create new job opportunities whereby some people will be employed by the project as management and enforcement agents, caretakers, cleaners, security personnel and technicians. Initiative will be made to inform local community about available employment opportunities and encourage them to apply. Where necessary training will be undertaken to provide necessary skills to local people in order to suit the requirements of the job.

Increased Revenue to Local and Central Governments: Through payment of relevant taxes, rates and fees to the government and the local authorities the project will contribute towards the national and local revenue earnings.

Contribute to Railway Side Community Welfare: Railway side communities especially near railway stations depend on the railway operations as an alternative source of income from vending. The project is likely to increase the vibrancy of their businesses as a result of improved and reliable railway services.

Promote and Attract New Investments: The project is likely to promote and attract businesses and investments along the railway line due to the improvement and reliability in railway transport services which are comparatively cost effective. Shopping and business centers are likely to be constructed in the small town of Usakos and lead to the expansion of Swakopmund whereas investments in agriculture and mining along the rail transect could be promoted by the project.

Increased land value: In the long-term, land value will gradually increase as a result of successful operation of the project.

Increased revenue: The operator will generate revenue from operations of which portion can be used for the maintenance and sustainability of the railway infrastructure.

Prolong Lifespan of Trunk Roads: Improved and reliable railway services will significantly reduce the use of trunk roads for transportation of goods by heavy vehicles and so prolong the lifespan of the roads.

8.2 Potential Negative Impacts

Solid Waste Generation/ Railway Side Littering

From the current experience of the ongoing railway operations, the project is expected to generate significant amounts of solid waste during its operation phase especially with the expected increase in the number of passengers utilising the upgraded, more efficient and reliable railway transport. The bulk of the solid waste generated during the operation of the project will consist of food remains, plastics, old clothes, metal, textile and organic wastes littered by railway service users. Such wastes can cause blockage to drainage systems, choking of water bodies and negative impacts on animal health. Some of these waste materials especially the plastics/polythene which are not biodegradable may cause long-term effects to the environment. TransNamib will prepare and implement an effective solid waste management at railway stations and within passenger and goods trains including provision of Wagons with mobile toilets. Waste removal will be monitored on daily basis during the operation phase by designated individuals.

Soil and Water Pollution from Oil Spills

The screening study observed minor oil spills along the railway line. Discussions with station masters and other technical staff revealed that the spills come from locomotive engines. Most of the locomotives in use are very old and have been running some decades without reliable repair and maintenance. The engines do not retain the oil used in them, thus the spills along the railway tracks and other areas where oil and diesel is used for repair of the engines such as the workshops. Investigation during the study indicated that the top soil had the most amount of oil, this could be observed by the eye and also by smell, the further down the hole went the smell started to disappear. The soil sample was analysed after every several centimetres to detect the presence of the oil in the soil; the smell was not detected after several meters. Consultations with local authorities dealing with water supply and sanitation revealed that hydrocarbons (oils) from railway operations were not a concern to the water supply since none of them has detected the presence of oils in the water sources used to supply the communities. And none of the authorities had received complaints from individuals with boreholes or wells close to railway stations. To mitigate whatever spills that might occur, TransNamib will buy and ensure regular servicing of locomotives and ensure that new oil traps in railway workshop are installed.

Risk of Rail accidents

There is risks to local communities from rail accidents (including pedestrians) especially in built up areas, and transport of dangerous goods such as sulphuric acid. This will be mitigated through the implementation of a Safety Management Plan which includes a good maintenance of track and rolling stock, use of barriers and signage, preparation of spill prevention and control procedures. Also Emergency Response Plan to manage major incidents if they should occur will be established. Also there will be a continuous awareness campaign conducted in collaboration with local authorities for communities on the dangers of pedestrians and livestock crossing the railway line. Appropriate Safety and security measures (e.g. barriers and fencing) and signalling equipment will be put in place as part of the railway upgrade.

Cumulative Impacts

The ESIA deliberately took into account that some impacts of the project were likely to have a cumulative effect on the environment. Critical analysis established that since the project will follow an existing alignment, it ruled out the conventional cumulative impacts associated with important cuts in the topography, effects on fauna movement, soil stability, increase risk of landslide and flooding. There will not be any Riparian vegetation clearance to result in cumulative adverse effects on terrestrial and aquatic biodiversity, soil stability and water quality. However, the rail project will have long-term cumulative beneficial impacts on transport, safety and the socio-economic environment. Cumulatively with other infrastructure projects on the Walvis Bay area such as strategic expansion of the Walvis Bay container terminal project, the upgrade of the railway line will improve accessibility and service provision in the region, resulting in a cumulative beneficial impacts on transport and the socio-economic environment. Temporary construction impacts are not expected to result in any cumulative effects as the projects will be spread geographically and in time, thus not affecting the same receptors. However, the accumulation of low adverse impacts on the biodiversity in different locations in the region could significantly affect the regional biodiversity over a long time and will be monitored.

9 INSTITUTIONAL CAPACITIES AND STRENGTHENING PLAN:

The Implementing Agency for the Project is the Directorate of Railway Infrastructure Management in Ministry of Works and Transport (MoWT). . Whereas the Ministry of Works and Transport is institutionally experienced to manage the implementation of major infrastructure projects, it lacks sufficient technical capacity in the Directorate of Railway Infrastructure Management to allow a dedicated and specialised environmental and social management function. The monitoring functions are in practice managed by the EPCM Consultant and addressed through the project management structures such as technical committees, project steering committee and site meetings. In addition the permit conditions of the environmental clearance will be monitored by the relevant Ministry of Environment and Tourism staff. In general terms the institutional capacity to effectively manage social and environmental matters is considered appropriate and adequate.

10. COSTS FOR ENVIRONMENTAL MANAGEMENT AND MONITORING

Costs of certain items associated with environmental management and monitoring will be an integral part of specific items incorporated in overall project budgets, and no separate budget is necessary to cover these aspects. Such items comprise;

- Marginal costs of the contractor to be incurred in complying with environmental protection clauses in the construction contract are incorporated in unit rates and bill items and will thus be included as construction costs. It should be noted that no significant increase in construction costs is expected in connection with requiring compliance with environmental protection clauses, since these merely require the contractor to behave in a responsible manner in relation to the environment, in accordance with good construction practice.
- Environmental monitoring carried out by the Supervising Engineer's staff including inputs by the Environmental Specialist recruited by the Consultant is an integral part of general supervision duties/responsibilities and will be covered by normal construction supervision cost estimates and contract.

Costs which will be incurred by the various departments of the GRN in connection with management duties such as supervision and monitoring of the project also covering the implementation of the ESMP are not included as direct costs on the ESMP implementation

11. MONITORING PROGRAM

The monitoring of environmental and social impacts for the project will be guided by the development of a comprehensive construction phase ESMP. Responsibilities under the ESMP are currently envisaged to be allocated between MoWT, its contractors and certain units with the Ministry of Environment and Tourism. MoWT intends to augment its capacity through use of consultancy services in order to meet the environmental and social obligations that will be required of it for the purposes of this project. Monitoring activities which will consist of baseline monitoring, site inspections, monthly reporting and internal audits. The contractor will appoint his/her own Environmental Officer, Health and Safety Officer, Fire Officer and a Waste Management Officer. The monitoring program is further elaborated in the table below.

Table 1. The summary of the monitoring program

Issue	Parameters	Location	Frequency	Implementation	Supervision
Waste management	Evidence of waste collection and disposal	Construction corridor Contractors camp	Immediate	Contractor	Supervision Consultant
Noise levels	Noise levels on dB (A); PPE provided to workers	Construction corridor and adjacent communities	As directed by the supervision consultant	Contractor	Supervision Consultant
Oil spills	Oil spills marks	Construction corridor/ equipment yard (during construction) and at refueling points within stations and workshops (during operation)	As directed by the supervision consultant	Contractor	Supervision Consultant/MET/MoWT
Accidents	Safety training for workers, accident reports, community consultations	Construction corridor	Monthly	Contractor	Supervision Consultant
Health	Signs, posters displayed, first aid kit HIV/AIDS awareness campaigns workers and communities, health checks for workers etc.	EMP /as in the social impact assessment report	Construction site and railway side communities	Monthly	Contractor/ Supervision consultant
Benefits to local community	Employment wage levels	Report on survey of local economy creation of local markets	Monthly (during construction) annually (during operation)	Contractor/Supervision Consultant/	MoWT Supervision Consultant/ MoWT and other relevant GRN Departments
Chance Finds of Physical Cultural Resources (PCRs)	Awareness about and efforts to follow Chance Finds Procedure (CFP)	Along the construction corridor from Walvis Bay to Kranzberg	On daily basis during earthworks	Supervision Consultant/	MET
Risk of Rail accidents	All likely accidents	Walvis Bay to Kranzberg	Continuous during operation phase	TransNamib	MoWT
Potential Positive Impacts during operation	Investments, Increased Revenue, Community Welfare, Increased land value, railway reliability etc.	Walvis Bay to Kranzberg	Annually	GRN relevant departments	GRN

Monitoring will include: Visual observations; Selection of environmental parameters at specific locations; Sampling and regular testing of these parameters.

12. PUBLIC CONSULTATIONS AND PUBLIC DISCLOSURE

Summary of public consultations and the opinions expressed:

A number of actions were taken to engage key stakeholders and the public regarding the proposed project to inform them about the project and obtain their valuable input. These efforts included the following:

- Meetings with MET and MET-DEA;
- Meetings with the four local authorities that are located within the project limits;
- Meetings with NamWater; National Heritage Council, and others;
- Communication with adjacent landowners;
- Three advertised public meetings, which were conducted in Swakopmund, Stingbank and Usakos;
- Installation of a notice board with relevant information in the project area

The results of the public consultation process indicated that the Interested and Affected Parties welcomed the proposed development. Also, no objections were raised against the Project from any of the consultative sessions or as a result of the public notices or advertisement.

Key issues raised were:

Concerns regarding safety of the rail line within urban areas;

- Preferences were expressed in favour of implementing by-pass to avoid urban areas (Swakopmund);
- Community preferences pertaining to develop community-based infrastructure, mainly water sources and sanitation, as part of the project; and
- Preference for optimizing the use of local labour

13. CONCLUSION

Evaluation of ESIA/ESMP and the feasibility studies, it is evident that the proposed project is associated with both positive and negative impacts during construction, operation and decommissioning phases of the project. The following recommendations are made to enhance the viability of the project:

- The proposed mitigation and enhancement measures (the ESMP) should be implemented in order to minimize and/ or avoid the identified adverse environmental and social impacts of the proposed project. The ESMP should be provided as part of the Contractor's contract.
- The EMP should also be implemented to track the effectiveness of mitigation measures and hence further improvement of the mitigation plan. Monitoring will be used as a means of ensuring compliance with national or international standards.
- MoWT of Namibia will be required to embark on a monitoring program as part of the construction to ensure that the project is not in any way causing adverse environmental and social impacts.

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ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN SUMMARY

Windhoek to Hosea Kutako International Airport Road Phase 2A

Project Title: Transport Infrastructure Improvement Project (Phase I):
Project Number: P-NA-DZ0-001
Country: Namibia
Department: RDGS/ PICU
Division: RDGS4

1. PROJECT DESCRIPTION AND OBJECTIVES

Project Background

The African Development Bank is planning to finance three strategic infrastructure investments in selected Harambee Prosperity Plan (HPP) identified priority sectors i.e. Transport – Rail and Road; Agriculture and Education. The proposed intervention in transport sector named the Namibia Transport Infrastructure Improvement Project (Phase I) will focus on two main components (i) Upgrade of the Walvis Bay – Kranzberg Railway Line and; (ii) Upgrade of the Windhoek to Hosea Kutako International Airport (HKIA) Road Phase 2A. This report summarizes the Environmental and Social Management Plan (ESMP) pertaining to the Windhoek to Hosea Kutako International Airport Road Phase 2A. A separate ESIA was undertaken for the Upgrade of the Walvis Bay – Kranzberg Railway Line.

Brief project description and key components

The Windhoek to Hosea Kutako International Airport Road Phase 2A project to be financed by the AfDB is part of the larger road development project from Windhoek to Hosea Kutako International Airport that has been divided into the three phases

- (i) Phase 1 – 8 km. Section from the intersection of Main Road 49 (MR49) to the south-west of Windhoek and continues to the extension of Sam Nujoma Drive to the south-east of Windhoek. The works are ongoing, awarded in January 2016 to M/s China Seventh Railway Group (Contract Sum = NAD 798 million), 15% estimated progress.
- (ii) **Phase 2A – 23.8 km km: Section between Sam Nujoma Drive Interchange up to a point east of the Kapps Farm Interchange.**
- (iii) Phase 2B – 17.0km Section from Kapps Farm to HKIA.

The project components are as follows: (i) Road Upgrading Works which will include road lighting improvement of the urban section (ii) consultancy services to cover design review, preparation of bidding documents, project supervision; road safety audit; and financial audits, technical audits; (iii) Institutional support and capacity building and development of a Road Sustainability Strategy and skills development promotion. The major environmental and social sub-components include the following: ; (i) implementation of the Environmental and Social Management Plan (ESMP), (ii) Compensation of Project Affected Persons (iii) Sensitization of communities and road users on HIV/AIDs.

Project Categorization

The preparation of the Windhoek to Hosea Kutako International Airport Road Phase 2A project and the categorization of its environmental and social risks was guided by the African Development Bank's policy requirements and the relevant Namibia legal framework. The scope and nature of works to be undertaken on the 23.8 kilometre road project has a multitude of socio-economic positive impacts and limited Environmental and social negative impacts. The magnitude of involuntary resettlement is minimal. The green field project which is only 23.8KMS will impact on land (and not homes and other assets) of only 3 individuals which is less than the 200 persons stipulated in the AfDB's ESAP to qualify the project as a category 1. The identified likely impacts, which are well articulated in this ESMP can easily be mitigated through a series of appropriate mitigation measures. The environmental and social risk characteristics of this project places it in the environmental category 2 according to the Bank's Integrated Safeguard System (ISS) hence requires an Environmental and Social Management Plan (ESMP). The Namibian Environmental Management Act does not provide for distinct project categorization. However, the initial assessment by the Ministry of Environment and Tourism (MET) considered the project not to pose high E&S risks in a range and that would require a full brown ESIA, hence it was recommended that an environmental scoping report and an Environmental Management Plan (EMP) be prepared for the project within the domain of the Namibian laws. These requirements are equivalent to the AfDB's category 2 requirement of an ESMP.

The Purpose and Preparation of the Environmental and Social Management Plan (ESMP)

The Environmental Impact Assessment and related documents including the ESMP for the project were prepared by VKE Namibia (Pty) Limited Consulting Engineers on behalf of the Namibia Roads Authority (RA). The purpose of this ESMP, which will form an integral part of the loan covenant, is to describe the actions that will be taken by the GRN to enhance positive impacts and to avoid, minimize, mitigate, compensate / offset negative impacts associated with the upgrade of the Windhoek to Hosea Kutako International Airport Road Phase 2A. The ESMP will also be used to monitor identified environmental and social impacts of the planned activities.

Public disclosure requirements.

Namibian Environmental Management Act (EMA) of 2007 makes public review of Environmental Assessment Reports mandatory but is silent on disclosure of the documents. The absence of this provision in the Namibian environmental law will therefore be addressed by applying the AfDB's requirements for both consultation and disclosure as stipulated in its Disclosure and Access to Information (DAI) policy and ISS. In this regard therefore, ESMP summary will be disclosed by the Bank on its website for 30 days to allow public review and comments.

2. POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK

African Development Bank Policies

The design, implementation and monitoring and evaluation modalities for the project have been informed by the Bank's environmental and social policies and guidelines. Considerations are premised on expectations for assessing and addressing environmental and social impacts in line with the Bank's Integrated Safeguards System (ISS) (2013). The overarching goal of the Banks ISS is to preserve and enhance the ecological capital and life-support systems across the continent. Based on the projects feasibility reports, all the five Operational Safeguards (OS) embedded in the ISS were considered and triggered, and these are;

- **Operational Safeguard 1:** Environmental and social assessment, which is the overarching Operational Safeguard that mainstreams environmental and social considerations in all Bank operations
- **Operational Safeguard 2:** Involuntary resettlement land acquisition, population displacement and compensation. Although the land take on the project is limited, OS2 was taken into consideration in the management of the compensation of the 3 individuals whose land is affected by the project.
- **Operational Safeguard 3:** Biodiversity, renewable resources and ecosystem services which reflects the objectives of the Convention on Biological Diversity to conserve biological diversity and promote the sustainable management and use of natural resources.
- **Operational Safeguard 4:** Pollution prevention and control, hazardous materials and resource efficiency, which is intended to achieve high quality environmental performance, efficient and sustainable use of natural resources, over the life of a project
- **Operational Safeguard 5:** Labour conditions, health and safety that basically protects workers right.

The Bank's policy provision on information disclosure and access is also triggered. It requires that all the people residing in the given areas of a project have the right to be informed of the proposed development project in their respective areas.

Namibia Policy, Legal and Administrative Framework

The ESIA was prepared with reference to key legal national instruments including the Constitution of the Republic of Namibia, the Environmental Assessment Policy (1995) and the Namibia's Environmental Management Act of 2007. All these pieces of legislation collectively promote sustainable social and economic development through the sound management of the environment and natural resources. Both the Environmental Assessment Policy (1995) and the Namibia's Environmental Management Act of 2007 recognize the trade-offs between economic development and environmental degradation and calls for the use of EIA and environmental monitoring as tools for minimizing impact of development on environment. The road construction project will integrate the principles of the environmental policy into the project so that work is done in an environmentally responsible manner. Other policies and guidelines of relevance to the project include the National Land Policy of 1998; Water Resources Management Act 2004, the 5th National Development Plan (NDP5), all of which provide sectoral frameworks for the mainstreaming of thematic areas into the development process.

Other Applicable Namibian Legislation

Other Namibian legislation of direct relevance to the Project are summarized in Table 1 below. Also given in this table are the Project specific implications of each relevant piece of legislation.

Table 1: List of Legislation Applicable to the Project

Statute	Provisions	Project Implications
Atmospheric Pollution Prevention Ordinance 45 of 1965	Part II - control of noxious or offensive gases. Part III - atmospheric pollution by smoke, Part IV - dust control, and Part V - air pollution by fumes emitted by vehicles.	Application for an Air Emissions permit from the Ministry of Health and Social Services (if required).
Forest Act 12 of 2001	Provision for the protection of natural vegetation. No regulations promulgated yet.	Permits should be obtained from Department of Forestry

Statute	Provisions	Project Implications
	<p>Section 22(1): It is unlawful for any person to “cut, destroy or remove:</p> <p>Any living tree, bush or shrub growing within 100 meters from a river, stream or watercourse on land that is not part of a surveyed erf or a local authority area without a sense.</p> <p>Vegetation which is on a sand dune or drifting sand or on a gully unless the cutting, destruction or removal is done for the purpose of stabilizing the sand or gully</p>	<p>for the removal of protected trees.</p>
<p>Hazardous Substances Ordinance 14 of 1974</p>	<p>Control of substances which may cause injury or ill-health or death of human beings because of their toxic, corrosive, irritant, strongly sensitizing or flammable nature, and for the control of certain electronic products and radioactive material.</p> <p>Does not regulate the transport or dumping of hazardous substances.</p> <p>Regulations only relate to the declaration of certain substances as hazardous substances.</p>	<p>The handling and storage of hazardous substances on the Project Site should be carefully controlled. Disposal of hazardous substances needs to be carefully controlled.</p>
<p>National Heritage Act 27 of 2004</p>	<p>Heritage resources to be conserved in development.</p>	<p>All archaeological sites to be identified and protected.</p>
<p>Nature Conservation Ordinance 4 of 1975</p>	<p>Requires a permit for picking (the definition of “picking” includes damage or destroy) protected plants without a permit.</p>	<p>In case there is an intention to remove protected species, then permits will be required.</p>
<p>Preservation of Trees and Forests Ordinance</p>	<p>Protection to tree species.</p>	<p>The Contractor will require a permit to remove any protected trees.</p>
<p>Soil Conservation Act 76 of 1969</p>	<p>Prevention and combating of soil erosion; conservation, improvement and manner of use of soil and vegetation, and protection of water sources.</p> <p>The Minister may direct owners or land occupiers in respect of inter alia water courses. No Regulations exist to this effect.</p>	<p>Removals of vegetation cover to be avoided and minimized at all costs.</p> <p>Soil pollution to be avoided.</p>
<p>Water Resources Management Act 24 of 2004</p>	<p>Section 32 states that no person may abstract or use water, except in accordance with a license issued under this Act. Abstraction of water including open waters, aquifer, brackish or marine water.</p> <p>Section 46 states that any drilling to be conducted or enlargement of an existing borehole can only be conducted under a permit issued under the Act.</p> <p>Section 56 states that a person may not discharge any effluent directly or indirectly to any water</p>	<p>Obligation not to pollute surface water bodies.</p> <p>The following permits are required in terms of the Water Act:</p> <p>Water abstraction permits that will form part of the contract obligations.</p>

Statute	Provisions	Project Implications
	<p>resource on or under the ground or construct any effluent treatment facility or disposal site unless in compliance with a permit issued under Section 60 of the Act. Where “effluent” means any liquid discharge as a result of domestic, commercial, Industrial or agricultural activities.</p> <p>Section 78 states that a person may not engage in any construction activity that impounds, blocks or otherwise impedes the flow of water in a watercourse without the Minister’s written approval authorizing such activity.</p>	
Public Health Act 36 of 1919	Provides for the prevention of pollution of public water supplies.	A general obligation for the Contractor not to pollute the water bodies in the area.

3. DESCRIPTION OF THE PROJECT ENVIRONMENT

General location

The proposed route is situated in the Khomas Region just east of the capital of Namibia – Windhoek. The areas affected is linear, due to the fact that it is a construction of a road, and can best be described as a corridor of about 1 km wide stretching from Sam Nujoma Interchange to the east of the Kapps Farm Interchange which is part of the road stretch from Windhoek to the Hosea Kutako International airport. This project is in part alongside (parallel to) the existing trunk road flowing to the east up to the airport.

Bio-Physical Environment

Topography

The project is situated in the topographical high points of the Central Highlands of Namibia. The area is characterized by hilly terrain with dominant surface water drainage patterns. The topography tends to flatten out towards the east of Windhoek. The average altitude varies from around 1800m in Windhoek to 1700m to the east at the HKIA. Mountain ridges are found to the south (Auas Mountains) and north (Otjihavera Mountains) of the proposed routes. These mountain ridges impede on the possibility of constructing alternative roads to the north or south of the existing airport road, therefore leaving only a small corridor of natural topography suitable for the construction of new roads to the east of Windhoek.

Geology

The project is situated in the Damara Super Group with specific reference to the Hakos Group (Ss) dominated by quartzite, schist, micaceous dolomite and amphibolite.

Soils

The project is located in an area dominated by the soil type classical of Lithic Leptosols. These soil types can be described as very thin or shallow soils typically formed in actively eroding landscapes, especially in hilly or undulating areas that cover much of the southern and north-western Namibia. These coarse-textured soils are characterized by their limited depth caused by the presence of a continuous hardrock, highly calcareous or cemented layer within 30cm of the surface. These soils are therefore the shallowest soil types in Namibia. Water holding capacity is low resulting in high erosion probability.²It is noted that rocky outcrops are found far to the south of the proposed project.

Climate

The proposed project falls in the typical Namibian highlands climate with warm summers and cool winters. Average annual temperatures vary between 18-20° C with the coldest months (June – July) recording temperatures below 0° C and the summer months (November – January) temperatures of up to 34° C (Mendelsohn et al. 2002). Frost does occur in this area and is calculated at about 10-15 days per year.

Surface Hydrology

The surface hydrology alongside the proposed route is characterized as hilly with fast flowing estuaries for short periods of time. Flash floods may occur during heavy rains. Limited natural dams occur in the area, but current existing dams are man-made therefore affecting the natural surface water drainage patterns and retarding the surface water run-off peaks. The Seeis River dominates the area and is situated to the north east of the proposed project with the Olifants River to the south. Environmental assessment indicate that no major surface water drainage patterns will be affected by the proposed project. Some smaller drainage lines will be crossed with various alternative routes.

Landuse

The proclaimed route that was determined in the 1970's would not have affected any land use during that time, but due to unplanned re-alignment of the route and improper management of the road servitude, some conflicts started to develop over the years. Currently the proclaimed route runs through the Herboth's Blick Development and some infringements (houses) are clearly visible in the proclaimed route. These situations prompted the Namibia Roads Authority to commission additional feasibility studies to determine the land use conflicts and suggest an alternative alignment. A full social impact assessment was conducted to determine the impact the alternative routes might have on land use and social process. The dominant land use in the project area is for residential purposes with limited commercial developments and fenced off farms. All of these land uses were taken into consideration during the investigation and evaluation phases to determine the most suitable alternative route.

Socio-Economic Environment

The following sections present the socio-economic profile of the Khomas Region where the project lies. The Khomas Region is situated at the centre of a road network that links the port of Walvis Bay with destinations such as Gauteng Province in South Africa via the Trans-Kalahari Highway, the Cape Province via the B2, and Botswana and Zimbabwe, also via the Trans Kalahari Highway. The region is considered to be the most affluent and Windhoek is by far the biggest urban settlement in Namibia. It is the seat of government and the gateway for tourist and business travel to Namibia. The population of the city is growing rapidly at about 3% per annum as elaborated in the next section. Analysis of the socio-economic environment provided a setting against which the potential impacts of the proposed road construction project were identified and mitigation measure proposed.

Demographic profile

According to the results of the 2011 Population and Housing Census, Khomas region registered a population increase from 250,262 people in 2001 to 342,141 in 2011 (GRN 2012). This level of increase is to be expected since the capital city of Namibia is the centre of almost all government functions and many business headquarters in Namibia. From 1991 to 2001 the population grew at a rate of 4.1% per annum slowing down to 3.1 % per annum between 2001 and 2012.

In Namibian context, Windhoek is a prelate city with 38.66% of the urban population of Namibia residing in the city as of 2001. By 2011 this reduced to about 36.56%. The population of the city is currently 5.2

times as much as Rundu, the next biggest urban area in Namibia in terms of population size. Windhoek dominates the Khomas Region and 94.6% of the regional population resides in the city. The Khomas region is also the region with the third highest population density in Namibia with 9.2 persons per km² (GRN 2012). The figures suggest that the high level of rural to urban migration, especially of younger males, is on the decrease and that the population of the city is slowly normalizing and reflecting the national trends. This is also supported through the decrease in the rate of growth between the censuses.

In terms of the population age distribution of the Khomas Region, the under 15 year age group decreased from 30% in 2001 to 29% in 2011. The working age group (15 to 59 years) of the Region remained constant at 70% while the above - 60 years age group stands at 4%. The sex ratio shows a decrease from 103 males per 100 females in 2001 to 98 males per 100 females in 2011. This is still higher than the national sex ratio of 94 males per 100 females. (GRN 2012). The household headship stand at 61 males heads as opposed to 39 female headed household.

Employment

The 2011 census recorded employment level as 70% of individuals over 15 years of age which is the same figure recorded in 2001. Main source of income in Khomas region is salaries and wages which make up 73%. Other sources of income at household level include business (non-farming) which accounts for 14%, pension 4%, cash remittances at 5% and farming at 1%. Males are far more likely than females to be employed in construction, transport and storage, while females are more likely than males to be employed in private households and wholesale and retail trade.

Access to Services

Again according to the Namibia 2011 population and housing census figures for Khomas region, the region is among the three regions in the country' with a high literacy rate with 97 percent of literacy among people aged 15 years and older. The figure is higher than the country's national literacy rate, which is estimated at 89 percent. The regional profile breakdown of the 2011 census on access to safe drinking water, toilet facilities and electricity shows that 99 percent of households in the Khomas Region have access to safe drinking water, while on 68 percent use electricity for lighting, registering a decline from 69% in 2001. Furthermore, 20% percent of households in Khomas are reported not to have access to toilet facilities and only 8% percent use wood or charcoal for cooking.

Health

There are 5 hospitals with 4 health centers and 42 clinics found throughout the Khomas Region. At the time the assessment was carried out, Windhoek had two public hospitals, three private hospital and about 35 clinics. There is a relative high proportion of the Khomas Region's population (90%) live within 10 kilometre of a health facility which is better than the national average (80%). The allocation of staff is also better than the national average where on average, there are 3 128 people per registered state doctor and 321 people per registered state nurse. Public hospital beds are better provided in the Region with one bed available for every 179 people in comparison to the national average of 271 people. If the private hospital beds are taken into consideration, the region fares even better compared to the national situation. The mortality rate for under 5 year olds is significantly lower (52 deaths per 1000) than the national average (69 deaths per 1000). Its impressive to note that just about everyone in the Khomas Region and everyone in the urban areas of the region has access to improved source of drinking water while improved sanitation (62%) is higher than anywhere else in Namibia

Manufacturing, Wholesale and Retail Trade

Windhoek has the largest number of manufacturing establishments in the country, which also reflects in the large number of people that are employed in the sector. The manufacturing sector in Windhoek is highly concentrated in three sub-sectors namely food produce and beverage, furniture and metal product manufacturing. (City of Windhoek: 2010)

Central Government

Being the seat of government puts Windhoek and the Khomas Region in a league of its own in Namibian context. Although a process of decentralization is ongoing, the de-facto situation is that the country is largely managed from Windhoek. All line ministries are seated in the capital, as is the parliament and the National Council. As such, it is the most important region in Namibia with the lion share of economic and government activities

4. PROJECT POTENTIAL ENVIRONMENTAL AND SOCIAL IMPACTS AND CLIMATE CHANGE RISK

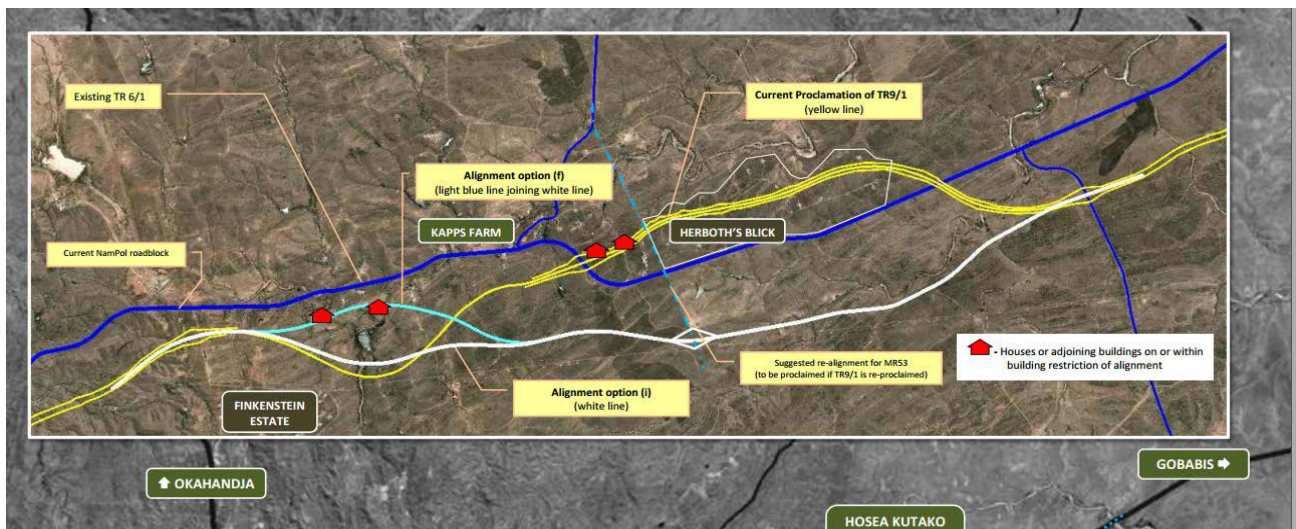
The process for the Environmental and Social Assessment carried out concurrently with the other feasibility studies and detailed design for the project, commenced with a scoping phase. The purpose of the scoping phase was to solicit as many potential issues or impacts as possible. Impacts considered were those that could be identified scientifically or and those which the general public and other interested and affected parties could foresee as a result of the proposed construction of the future freeway between Windhoek and Hosea Kutako International Airport. The following section presents a summary environmental impacts together with proposed mitigation/enhancement measures as identified during the assessment.

4.1 INVOLUNTARY RESETTLEMENT

The government of Namibia has already proclaimed the Right of Way for the proposed road. The proclaimed re-alignment affects only two individuals (Mrs Finke and Mr Diekmann involving 12ha and 6.5ha respectively), for whom compensation payments have been approved by the Hon Minister.

The compensation was determined within the Roads Ordinance – and compensation which are determined by the Minister, as no compensation is applicable where a new freeway is proclaimed, only where an existing bitumen road is upgraded and widened to freeway standards. Both were treated in terms of the law.

The map below shows a re-proclamation of T0901



The Map showing all residential developments along the project alignment including the affected estates

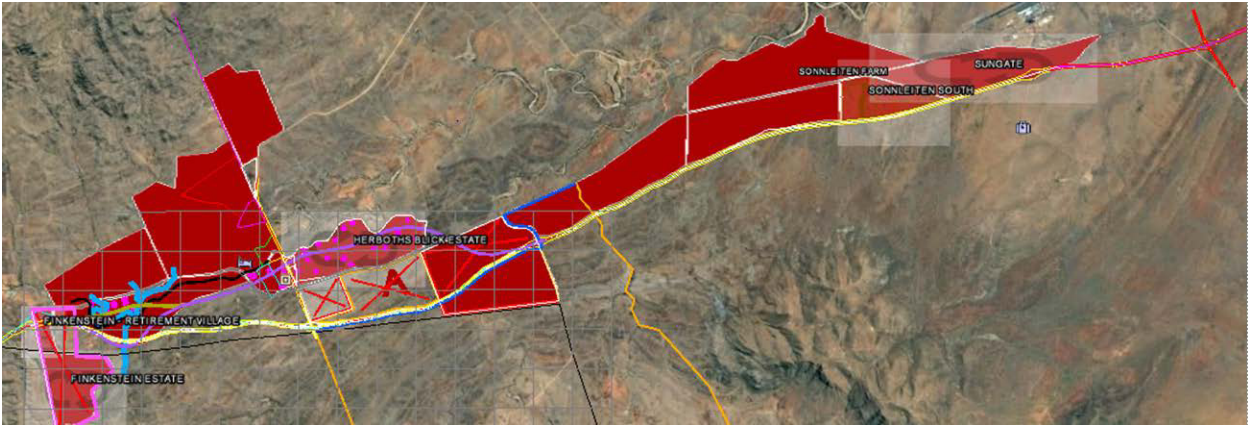


Table 2: Enhancement/Mitigation Measures for bio-physical environment

Component/Issue	Objective	Management Measures	Responsibility/ Partnerships
Management and Monitoring	To ensure that the provisions of the ESMP are implemented during construction.	<ul style="list-style-type: none"> i. The Project Consultant shall ensure that all aspects of the ESMP are implemented during construction. ii. Also the Project Consultant/or appointed staff shall attend regular site inspections and meetings and minutes shall make provision for reporting on every aspect of the ESMP. 	Supervision Consultant/ Environmental Control Officer (ECO).
Communication and Stakeholder Consultation	To ensure that all stakeholders are adequately informed throughout construction phase and that there is effective communication and feedback with all stakeholders.	<ul style="list-style-type: none"> i. The Contractor shall appoint an ECO from the construction team to take responsibility for the implementation for all provisions of this ESMP and to liaise between the Contractor, Community, Client and Consultants. The ECO must be appointed within 14 days after the site-handover. ii. The Contractor shall at every site meeting report on the status of the implementation of all provisions of the ESMP. iii. The Contractor shall implement the environmental awareness training as stipulated in the ESMP. iv. The Contractor shall liaise with the Project’s supervising consultant regarding all issues related to community consultation and negotiation as soon as possible after construction commences. 	Contractor/ Supervising Consultant
Health and Safety	To ensure health and safety of workers and the public at all times during construction	<ul style="list-style-type: none"> i. This is a green field projects with minimum disruption to traffic flow however in sections where the construction is likely to affect traffic flow, the Contractor shall submit a strategy to ensure the least possible disruption to traffic and potential safety hazards during construction. ii. The strategy should include a schedule of work indicating when and how road crossings (construction at existing intersections) will be made. The schedule will be updated and distributed to all stakeholders. iii. The Contractor shall also liaise with the Traffic Authorities in this regard. Proper traffic and safety warning signs will be placed at the construction site to the satisfaction of the Engineer and the Roads Authority. iv. The Contractor will adhere to the regulations pertaining to Health and Safety, including the provision of protective clothing, failing which the Contract may be temporarily suspended until corrective actions were taken. v. Dust protection masks shall be provided to task workers if they are exposed to dust. 	<p>The ECO will monitor.</p> <p>Contractor will ensure the mitigation measures are enforced at his own Expense.</p>

Component/Issue	Objective	Management Measures	Responsibility/ Partnerships
		<ul style="list-style-type: none"> vi. Surface dust will be contained by wetting dry surfaces periodically with a water bowser, sprinkler system or any suitable method. This applies for the construction site as well as all the roads. vii. Potable water shall be available to workers to avoid dehydration. This water shall be of acceptable standards to avoid any illness. At least 5 liters of drinking water per person per day shall be made available during construction. viii. The Contractor shall enforce relevant Health and Safety Regulations for these specific activities. ix. The Contractor shall also comply with relevant Labour Laws as stipulated by the Labour Act. x. The Contractor shall implement a HIV/AIDS awareness programme as part of Health and Safety. xi. Blasting may only be conducted by a qualified person and all laws and regulations will be enforced before and during blasting. 	
<p>Conservation of the Natural and Historical Environment</p>	<p>To avoid/minimize damage to soil, vegetation and historical resources during the construction phase. Damage is likely to include soil crusting, soil erosion and unnecessary vegetation destruction.</p> <p>Also Management of water (domestic and construction). Management of other sensitive areas.</p>	<ul style="list-style-type: none"> i. At the outset of construction (or during construction as may be applicable), the ECO and the Contractor shall visit all proposed borrow pits, haul roads, access roads, camp sites, and other areas to be disturbed outside the road reserve. Areas to be disturbed shall be clearly demarcated, and no land outside these areas shall be disturbed or used for construction activities. ii. Detailed instructions and final arrangements for protection of sensitive areas, keeping of topsoil and rehabilitation of disturbed areas shall be made, in line with the guidelines in the ESMP. The ECO shall be consulted before any new areas are disturbed which have not yet been visited. iii. No off-road driving shall be allowed, except on the agreed haul and access roads. iv. Vegetation shall be cleared within the road reserve as necessary for the construction of the road. The area on either side of this corridor may not be cleared of vegetation, unless permission is given to do so for detours or access roads. This measure is subject to the Roads Authority of Namibia's specifications with regard to the road reserve. v. A prescribed penalty will be deducted from the Contractor's payment certificate for every mature tree removed without approval. vi. Where compaction has taken place in disturbed areas, these areas will be ripped and covered with topsoil kept separate for this purpose. 	<p>Contractor will ensure the mitigation measures are enforced at his own expense.</p> <p>The ECO will monitor implementation.</p>

Component/Issue	Objective	Management Measures	Responsibility/ Partnerships
		<ul style="list-style-type: none"> vii. The killing of any animal (reptile, bird or mammal) is prohibited. viii. A prescribed penalty will be deducted from the Contractor's payment certificate if it is shown that any of his staff or sub-contractors are involved in trapping, hunting or any kind of collecting of wild animals in the vicinity of the work sites. Offenders will be handed to the authorities for prosecution. ix. Pipelines for the pumping of construction water shall as far possible run within the road reserve and along existing tracks and other roads. Water will not be allowed to be wasted. This includes water required for construction and domestic purposes. x. Collection of plants or parts of plants (including fire wood of any size or description) is forbidden. xi. As far as possible existing tracks alongside the existing road and within the present servitudes should be utilized for both construction and maintenance. These should be clearly indicated, together with designated turning points and construction laydown areas. The area used should be constrained as far as possible. 	
<i>Enhancement/Mitigation Measures for bio-physical environment</i>			
Compensation Resettlement	<p>To address residents' concerns such reduction in the property values of already established estates of Finkenstein and Herboth's due to the proximity of the proposed freeway to these estates which will lead to sound and air pollution.</p> <p>Compensate for the displacement of residents to make way for the road/road reserve</p>	<p>In order to mitigate the impact of the road, seven alignment options were considered and those options that have the least impact were selected. This means that in terms of impact on property values and land take, these options most effectively mitigate the potential impacts across the entire route and not necessarily for any individual land owner.</p>	MOWT/RA
Traffic diversions	<p>Manage the disruption and inconvenience to residents due to detours, local road closures, dust, noise, heavy equipment traffic, changes in level of service, safety hazards</p>	<p>During the construction phase, besides normal care to control traffic and ensure safety through road signs and markings, no additional mitigation measures are required.</p> <p>Once the freeway is completed it will have a high impact on improvement of levels of service and road safety. No further enhancement measures are</p>	Contractor/Supervising Engineer and Roads Authority

Component/Issue	Objective	Management Measures	Responsibility/ Partnerships
	and interference with emergency services	required	
Improved road safety	Road safety will be improved but risk of accidents on the new road will increase hence requires mitigation measures	It is necessary to augment this with effective traffic law enforcement, especially speeding, as well as the general sensitization of the travelling public on matters related to traffic safety in general and on this road in particular.	Contractor/Supervising Engineer and Roads Authority
Creation of employment opportunities	Manage the employment opportunities as a result of the project	In order to ensure that the benefit of employment creation will filter down to a local level it is necessary to include the obligation to recruit and use local workers from Windhoek and Kapps Farm to the maximum extent possible and practical. It is recommended that the successful contractor be obliged to only bring key staff from its head office, if outside the region, and to then set up an employment office and recruit local people for as high a proportion of the project scope as possible. Local political leaders and the Ministry of Labour should be involved in this process and partake in formulating the recruitment plan and conditions.	Contractor/Supervising Engineer and Roads Authority
Increase in the spread of HIV/AIDS and other STDs	Interaction between workforce and local communities may increase occurrence of communicable diseases, including HIV/AIDS and other sexually transmitted diseases (STDs) which must be mitigated.	It must be a condition of the construction contract that HIV/AIDS awareness campaigns be undertaken amongst all construction staff. A suitably qualified person must design and implement the programme throughout the course of construction. Monitoring and evaluation of this must form part of the EMP.	Contractor/Supervising Engineer
Impact on the Windhoek streets	The upgrade of the road will directly impact positively on the traffic of Windhoek streets	City of Windhoek and Roads Authority prepare and conclude the legal process required to oblige heavy vehicle through traffic to use the southern and western bypasses to move through the city and prohibit through traffic to enter the city. Only local heavy vehicle traffic legitimately needing to enter the city for deliveries and construction activities should be allowed on the city streets.	City of Windhoek/Roads Authority
Wider and better local and regional connections, improved transport of commodities and improved access to markets	-	No further enhancement measures required	NA

5. MONITORING PROGRAM

It is planned that the environmental and social impacts and their designed mitigation measures shall be monitored during implementation and operation phases of the project. The roles and responsibilities for monitoring the environmental and social impacts and mitigation measures are as follows; The Contractor will be responsible for ESMP implementation while the Roads Authority, the mainstream Ministry of Works and Transport (MoWT), the Roads Fund Administration will ensure compliance with all requirements stipulated in the ESMP including the compensation of the 3 individuals whose land is to be affected by the project. Compensation will be done in conjunction with the Ministry of Finance, in accordance with the Bank's OS2 and Namibian land proclamation laws. The Project Engineer who will be the representative of the Roads Authority on the project together with the designated RA staff will monitor the regular implementation of the ESMP with guidance from the office of the Director Roads Infrastructure in the MoWT. The Environmental Affairs Department (EAD) of the Ministry of Environment and Tourism will undertake compliance monitoring and periodic inspection of the construction site.

The monitoring of the impacts will focus on the following points: rehabilitation of quarry sites and borrow pits; number of men and women who are employed; compensation payment to the project affected persons (PAP) and the date of payment; number of workers and community members (segregated by gender), who have undergone sensitization on the HIV/AIDS, environmental protection and personal hygiene and sanitation; the number of accidents that occurred during the construction; etc. The implementation of the ESMP will be one of loan covenants in the agreement signed between the borrower and the Bank. All the mitigation measures specified in this plan shall be included in the bid documents for the successful enterprise to implement. Campaigns on HIV/AIDS, environmental protection and personal hygiene and sanitation shall also be undertaken. For this purpose, services of experienced NGOs in the fields will be sought. The malaria and the HIV/AIDS campaigns would be undertaken in the framework of the Ministry of Health relevant programs.

6. PUBLIC CONSULTATIONS AND DISCLOSURE REQUIREMENTS

The methodology followed during the public participation process was to make use of existing communications between VKE Namibia Consulting Engineers, the relevant stakeholders and interested and affected parties, as well as personal interviews conducted by Enviro Management Consultants Namibia. The objectives of the meetings were to inform the various Stakeholders and the general public about the project and to receive any comments or concerns with regard to the design of the proposed route, the natural environment that will be affected by the project as well as the social impact this project might have. A background information document (BID) was also prepared with the objective of providing background information in preparation for the public meetings. The BID was sent to all stakeholders on the database by hand delivery, e-mail or fax prior to the meetings. Invitations to a public meeting were published in the Namibian, Republikein and the Allgemeine Zeitung on the 15th and 22th of November 2011.

Review of the basic planning for TR9/1 & TR6/1 Windhoek to Hosea Kutako Airport

The first meeting was held on the 23rd September 2011 where the proposed project was introduced to participants who included key figures such as the Mayor of Windhoek, Khomas Regional Council (KRC) Development and Economic Planners, representatives for the City of Windhoek and private interested parties. The objectives of these meetings were to share information about the project with the relevant stakeholders. Questions were asked with regard to the technical part of the project and were clarified by the Consultant and RA. The project was well received with very little negative commentary or concerns.

The second meeting was held on the 29th November 2011 at the Nampower Convention Centre where the public was invited to attend and comment on the project. The meeting was well attended and the project was explained to the public at large. Representatives of the various land users were present at the meeting and various inputs were received from the public. Although not all comments are included in this summary, a full comment sheet is available in the Social Impacts Assessment – Public Participation Report available with Roads Authority, the Bank and the VKE Consultants.

Following these meetings, the residents of Finkenstein Estate requested an additional meeting which its members could attend and air their specific concerns. This meeting was held on 26 January 2012 at the SKW Hall in Windhoek.

Summary of Issues and Concerns Raised by Stakeholders

Homeowners of the Finkenstein Estate: The homeowners of the Finkenstein Estate, a high end residential estate with about 221 erven, can be regarded as one of the key stakeholders in the project. During the public consultation process, only a small number of alternative alignments were presented and this caused great concern among the homeowners. It was felt that the alternatives considered were limited, biased in favor of engineering considerations and that the social and environmental considerations are playing second fiddle. Residents felt that the estate was developed and they bought their erven with the understanding that the future freeway will be aligned as currently proclaimed and that any realignment which will bring this road closer to the estate will negatively affect property values and make them subject to much more sound and air pollution than would be the case if the current alignment is retained. Most arguments during the dedicated meeting were objections against the potential alignments proposed and suggestions as to other potential alignments. However, residents also alluded to traffic problems at the entrance to Windhoek and indicated that this should be attended to.

A meeting was also held with the owner of the Farm Finkenstein – Mrs Finke. This meeting was held between EMC Namibia, Mrs Finke, a Geo-hydrologist and Mr Klink from VKE Namibia. Mrs Finke had some concerns with regard to the vegetation found specifically on the site. Mrs Colleen Mannheimer (the flora specialist on this project) was contacted in this regard to verify the concerns Mrs Finke had. After thorough investigation and consultation between Mrs Mannheimer and Mrs Finke the concerns were laid at ease when the flora specialist indicated that the various flora species of concern were not listed as protected and are abundant in the area in and around Finkenstein Farm.

Homeowners of Herboth's Blick: Herboth's Blick, another low density residential estate, was established with the full knowledge of the current proclaimed alignment of the future freeway. This alignment means that the freeway will run straight through the middle of the estate, to such an extent that some of the plots will basically be totally taken up by the servitude. The purchase agreements for the plots in Herboth's Blick indicated the position of the freeway servitude and buyers were made aware of it. However, it is alleged by some that they were not aware of the servitude. It also seems that purchasers thought that the road is unlikely to be built and therefore the risk was not significant enough for them not to buy a plot. Others questioned the decision making process and wondered how this could have been approved by the authorities. They were also concerned about their property values, loss of land and the impacts of sound and air pollution which will result from a freeway on the current proclaimed alignment.

In addition, Herboth's Blick owners stated that, as daily road users, the biggest traffic related problem with the current road is the bottle neck where TR6/1 enters Windhoek at Avis as well as the heavy vehicle

traffic that has no option but to drive through Windhoek to reach the northern industrial area or the northern and western parts of Namibia.

The Retirement Village: A future retirement village is planned to the north of Finkenstein. The developer considered the current freeway servitude and did the layout planning accordingly. At the time of consultation, their concern was that an amendment to this alignment would result in abortive town planning costs as well as cause a substantial delay in obtaining the required statutory approvals to commence with the development. This will have a substantial financial cost for the developer.

Other stakeholders: Other stakeholders listed the following issues:

- Ensuring that local Namibians are employed in the construction of the road;
- Ensuring that the freeway will result in the deviation of traffic (especially heavy vehicles) from Windhoek's streets;
- People who will be negatively affected by the new alignment should be compensated accordingly;
- The issue of opening up borrow pits on the adjacent agricultural land to obtain road building material; and
- Assurance that once the alignment is fixed this time, that the Roads Authority will enforce building restrictions and ensures that the road reserve of

As a result of these three impacts or concerns raised by stakeholders, a number of clear alignment alternatives were formulated and assessed in terms of the increase in noise levels, increase in air pollution and the extent of land take that will result from each alignment. The results of this assessment is that the currently proclaimed reserve as well as the originally proclaimed reserve approximately from the current police road block to a point where it intersects with the road to Dordabis will both have a substantial negative social impact on the communities of the Finkenstein Estate, the smallholdings in the Kapps Farm area and the Herboth's Blick residential estate.

The alignments before and after these points has no or very little social impact. This requires other alignment options between these two points. The option of following the alignment of the existing road will also have a high impact because it will require the construction of a service road along this stretch of road which will again have a similar social impact.

The alignment options with the least impact and therefore the most desirable from a social impact perspective are those that deviates from the currently proclaimed alignment north of the Finkenstein Estate at a point which is further away from the estate than the current alignment and then follows an alignment running close to the existing power lines to the intersection with the Dordabis road.

7. INSTITUTIONAL ARRANGEMENTS AND CAPACITY BUILDING REQUIREMENTS

ESMP Administration

The institution that has overall responsibility of ensuring that the ESMP is implemented in the Roads Authority in the Ministry of Works and Transport. There are no permanent Environmental and Social expert in the RA and MoWT. However, similar projects have been successfully implemented through hiring of Consultants with the necessary capabilities which is the same approach to be used for the Windhoek to Hosea Kutako International Airport Road project. During the appraisal mission conducted by the Bank, it was established that VKE Namibia (Pty) Limited Consulting Engineers who carried out the Feasibility studies and detailed designed for the project will remain on contract to supervise the implementation of the project including the implementation of the ESMP. From discussions and review of the various reports, GRN has appropriate institutional arrangements and substantive capacity to implement the ESMP on this project.

To manage the ESMP implementation, copies of the approved ESMP shall be given to all relevant departments, kept at the site office and will be distributed to all senior contract personnel. All senior personnel shall be required to familiarize themselves with the contents of this document.

Roles and Responsibilities

The implementation of the ESMP requires the involvement of several stakeholders, each fulfilling a different but vital role to ensure sound environmental management during each phase.

Engineer's Representative (ER)

The Engineer will delegate powers to the Engineer's Representative (ER) on site who will act as the Employer's implementing agent and has the responsibility to ensure that the Employer's responsibilities are executed in compliance with relevant legislation and the ESMP. The Engineer also has the responsibility to approve the appointment of the Environmental Control Officer (ECO).

Any on-site decisions regarding environmental management are ultimately the responsibility of the ER. The ER will have the following responsibilities in terms of the implementation of this ESMP:

- Controlling that the necessary environmental authorizations and permits have been obtained by the Contractor.
- Assisting the Contractor in finding environmentally responsible solutions to problems with input from the ECO where necessary.
- Taking appropriate action if the specifications are not followed.
- Ordering the removal of person(s) and/or equipment not complying with the ESMP specifications.
- Recommending and issuing fines for transgressions of site rules and penalties for contravention of the ESMP.
- Advising on the removal of person(s) and/or equipment not complying with the specifications.
- Receive and record any complaints (concerning environmental matters) from landowners or the public.
- Auditing the implementation of the ESMP and compliance with authorization on a monthly basis.
- Undertaking a continual review of the ESMP and recommending additions and/or changes to the document after completion of the contract.

Environmental Control Officer (ECO)

The Environmental Control Officer (ECO) will be a competent person from the staff of the Engineer to implement the on-site environmental management of this ESMP by the Contractor. The ECO shall be on site daily and the ECO's duties will include the following:

- Assisting the ER in ensuring that the necessary environmental authorizations and permits have been obtained.
- Maintaining open and direct lines of communication between the ER, Contractor and interested and effected parties (I&APs) with regard to environmental matters.
- Convening and facilitating public meetings.
- Regular site inspections of all construction areas with regard to compliance with the ESMP.
- Monitoring and verifying adherence to the ESMP, monitoring and verifying that environmental impacts are kept to a minimum.
- Assisting the Contractor in finding environmentally responsible solutions to problems.
- Monitoring the undertaking by the Contractor of environmental awareness training for all new personnel coming onto site.

The Contractor

The duties of the Contractor are as follows:

- The Contractor shall be familiar with the contents of the ESMP in order to understand the mitigation measures and the reasons for the measures.
- The Contractor's site agent and his Safety Health and Environmental Officer (SHE) shall at all times be in possession of this ESMP.
- Attend lectures / training that deals with environmental issues and the content of the ESMP.
- The Contractor shall through the SHE ensure that he complies fully with the Environmental Specifications. This includes all plant operators, transport vehicles, and sub-contractors.
- The Contractor should also notify the ER of any activity that could or did impact negatively on the environment.

Environmental Awareness Training

Before any work is commenced on the Site, the Contractor shall ensure that adequate environmental awareness training of senior site personnel takes place and that all construction workers receive an induction presentation on the importance and implications of the ESMP. The Contractor shall liaise with the Engineer during the establishment phase to fix a date and venue for the training and to agree on the training content.

The Contractor shall provide a suitable venue and ensure that the specified employees attend the course. The Contractor shall ensure that all attendees sign an attendance register, and shall provide the ER with a copy of the attendance register. The presentation shall be conducted, as far as is possible, in the employees' language of choice. As a minimum, training should include:

- Explanation of the importance of complying with the ESMP.
- Discussion of the potential environmental impacts of construction activities.
- The benefits of improved personal performance.
- Employees' roles and responsibilities, including emergency preparedness.
- Explanation of the mitigation measures that must be implemented when carrying out their activities.
- Explanation of the specifics of this ESMP and its specification (no-go areas, etc.)

- Explanation of the management structure of individuals responsible for matters pertaining to the ESMP.
- A HIV/AIDS awareness programme as part of Health and Safety issues.
- The Contractor shall keep records of all environmental training sessions, including names, dates and the information presented.

Public Participation

An on-going process of public participation shall be maintained during construction to ensure the continued involvement of interested and affected parties (I&APs) in a meaningful way.

Public meetings to discuss progress and any construction issues that may arise shall be held at least every three months and more regularly if deemed necessary by the ER. These meetings shall be arranged by the ECO but shall be facilitated by the ER. The Contractor shall present a progress report at each public meeting. All I&APs that participated in or were informed during the EIA shall be invited to each of the public meetings.

8. ESTIMATED COSTS

Costs of certain items associated with environmental management and monitoring will be an integral part of specific items incorporated in overall project budgets, and no separate budget is necessary to cover these aspects. Such items comprise;

- Marginal costs of the contractor to be incurred in complying with environmental protection clauses in the construction contract are incorporated in unit rates and bill items and will thus be included as construction costs. It should be noted that no significant increase in construction costs is expected in connection with requiring compliance with environmental protection clauses, since these merely require the contractor to behave in a responsible manner in relation to the environment, in accordance with good construction practice.
- Environmental monitoring carried out by the Supervising Engineer's staff including inputs by the Environmental Specialist recruited by the Consultant is an integral part of general supervision duties/responsibilities and will be covered by normal construction supervision cost estimates and contract.

Costs which will be incurred by the various departments of the GRN in connection with management duties such as supervision and monitoring of the project also covering the implementation of the ESMP are not included as direct costs on the ESMP implementation

Abbreviated Resettlement Plan has been developed to mitigate loss of property. The cost estimate for compensation is in the sum of NAD 16,000,000 (USD 1.2 million – August 2017)

9. IMPLEMENTATION SCHEDULE AND REPORTING

The implementation of the environmental and social measures shall last throughout the project cycle. The main responsibility of monitoring the progress of the project implementation shall lie with the Roads Authority in the Ministry of Works and transport. The RA shall be responsible for designing project monitoring systems and record keeping. It will prepare progress reports, including quarterly reports, which will need to be submitted to the Bank. The designated RA staff together with the Engineer will be

responsible for the preparation of reports on the effectiveness of the implementation of the environmental and social mitigation measures and any improvement that would be required.

11) REFERENCES AND CONTACTS

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References:

Project Feasibility Study and Detailed Report including
Volume 1 - Feasibility Study Report - this document
Volume 2 - Environmental and Social Impact Assessment Report
Volume 3 - Preliminary Design Drawings
Draft Detailed Design Report